

A Study on Building Knowledge Society in Karnataka



KARNATAKA JNANA AAYOGA
(KARNATAKA KNOWLEDGE COMMISSION)

GOVERNMENT OF KARNATAKA

AUGUST 2011



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No. 27, 1st Floor, 6th Cross, 1st Main,

1st Block, Koramangala, Bengaluru - 34

Tel : 080 - 41280009

email : clic@sochara.org / cphe@sochara.org

www.sochara.org



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KARNATAKA JNANA AAYOGA

(Karnataka Knowledge Commission)

Government of Karnataka



Dr. K. Kasturirangan

Chairman

Preface

Karnataka Jnana Aayoga (Karnataka Knowledge Commission) was constituted in September 2008 under the Chairmanship of renowned space scientist Dr. K.Kasturirangan, who is also a Member of Planning Commission, Government of India. The mandate of the Commission is to transform Karnataka into a vibrant knowledge society. To accomplish the stated mandate, the Commission identified six focus areas, submitted sixty recommendations and commissioned six research studies.

As a prelude to transforming Karnataka into a vibrant knowledge society, a need was felt to understand national and global perspective on constituents of a knowledge society. Therefore, a research study titled *A Study on Building Knowledge Society in Karnataka* was envisaged with the following terms of reference-

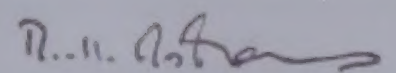
- To define the concept of knowledge society in the context of Karnataka
- To create knowledge resource profile of Karnataka
- To map Karnataka's knowledge requirement
- To identify knowledge gaps (macro and micro)
- To evolve a roadmap to build knowledge society in Karnataka.

Based on the views of the various development agencies such as the World Bank, UN Department of Economic and Social Affairs and National Knowledge Commission on knowledge society, a framework was developed. The framework defines the three vital components of a knowledge society- 'creation' 'dissemination', and 'application' of knowledge. The framework is then applied to Karnataka. Resource mapping and profiling was undertaken to identify strengths and gaps in terms of knowledge creation, dissemination and application. The report presents a roadmap to transform Karnataka into a vibrant knowledge society by 2020.

I thank Mr. Ashok Varma, Executive Director of PricewaterhouseCoopers Private Limited and his team for carrying out this research study for KJA. I am thankful to Principal Secretary and other officers of the Department of Higher Education, GOK for their kind support. I also thank KJA Members for giving feedback on the report.

My special thanks to staff and research associates of the KJA for their support.

30th August, 2011



Prof. M.K. Sridhar, Ph.D.,
Member Secretary & Executive Director
Karnataka Jnana Aayoga
Government of Karnataka.

Research Team

Project Head

Mr. Ashok Varma
Executive Director
PricewaterhouseCoopers Private Limited
India.

Research Coordinators

Dr. Vinayachandra B.K.
Research Associate
&
Dr. Padmavathi. B.S.
Senior Research Associate
Karnataka Jnana Aayoga
(Karnataka Knowledge Commission)
Government Karnataka.

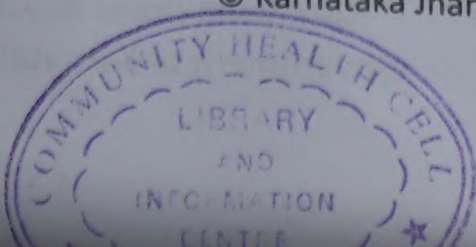


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Executive Summary

The primary objective of this study is to define the elements of a knowledge society, assess the present status of these elements in the context of Karnataka, identify the gaps and propose specific recommendations to propel the desired transformation into a vibrant knowledge society, as envisioned in the Vision 2020 of the State. The study focuses on the five core sectors of Education, Health, Agriculture, Rural Development and Urban Development. The key mode of assessment in this study has been secondary data analysis supported by primary data collected through interactions with about 1250 respondents across the following stakeholder groups covering 8 districts:

- *Beneficiaries of major government schemes and public services* (e.g. – college students, farmers who have got government assistance, pregnant women, etc.)
- *Service Providers* from government departments, private organization and not-for-profit organizations (e.g. - doctors at health centres, teachers at government schools, government, functionaries at the Gram Panchayats, etc.)
- *Researchers, academicians and policy planners* including sector experts, researchers and faculty at research institutions, government department functionaries at the secretariat, and KKC members

Concept of Knowledge & Knowledge Society in the context of Karnataka

Knowledge, in its purest form, is an embodiment of truth, well-justified belief and propositions. It links cause and effect relationships of natural and man-made phenomena. In practical terms, organised and well structured form of knowledge is a multidimensional concept drawn from various disciplines and schools of thought. Moreover Knowledge forms the very base of holistic human development in all societies. It is increasingly seen as one of the most important factors in determining a nation's competitive advantage and thereby influences the development of its people and society.

A Knowledge Society is centred on Knowledge for its development. It can be built when the inherent and new knowledge of a State rhythmically translates into competitiveness, productivity, social welfare, good governance and human development.

Key Components of a Knowledge Society: Encapsulating the major themes discussed around the subject of Knowledge and Knowledge Society, by various development agencies (such as the World Bank, UNDP, National Knowledge Commission, etc) the key components of a Knowledge Society have been identified. The key components are:

- *Knowledge Creation* - Engagements for producing new Knowledge
- *Knowledge Dissemination* - Engagements for spreading and sharing Knowledge
- *Knowledge Application*- Engagements for transforming knowledge into effective action

Characteristics of a Knowledge Society: The concept of Knowledge Society is centred on knowledge as the key component of economic, social, cultural and other human development activities, in contrast to other forms of societies where factors such as labour and capital constitute the dominant resource. The study identifies the five key characteristics of a Knowledge Society as:

- *Universal Presence of Knowledge* – There exists knowledge in all which is intrinsic in a society and its people. A Knowledge Society develops the capacities latent in human nature and integrates their expressions to foster development.
- *Universal Access* – In a Knowledge Society, existing and new knowledge on various sectors and aspects of the society are accessible to all based on necessity and feasibility.

- *Equity in Access* – Availability and access to knowledge, irrespective of age, gender, class, socio-economic, political or religious background, location etc is a key characteristic of a Knowledge Society.
- *Knowledge Empowerment* – With universal access and equity, each individual is connected to latest developments in the global, national, and state-specific environ. This leads to empowerment of the citizens and penetration of excellence in the grass roots of the Knowledge Society.
- *Lifelong Learning*: is an intrinsic part of Knowledge societies, leading to continuous progress and development.

Knowledge Resource Profiling, Mapping Requirements & Identification of Gaps

Knowledge Creation in Karnataka: Based on analyses of input and output parameters which are used to measure the extent of research and development activities, strengths and weaknesses in knowledge creation in Karnataka have been identified, as listed below.

Strengths:

- Bangalore has emerged as the 'Research & Innovation' hub with a number of premier institutions undertaking research.
- Districts like Mysore, Dakshina Kannada, Gulbarga, Shimoga & Dharwad have a strong base of Higher Educational Institutions and Industrial centres.
- The State stands at second position nationally with respect to Patent Applications made. These applications are made in a variety of research areas including IT, Biotechnology, Pharmaceuticals and Social Sciences etc.

Weaknesses:

- Districts other than Bangalore Urban lack in applied research.
- Science and Technology streams have Excess Demand for researchers whereas Humanities and Social Studies have Excess Supply.
- Lower transition of women after post graduation leading to lesser number of women researchers in the State
- Lack of strong incentives to practice quality research leading to a decline in interest towards academic research
- Insufficient inter-disciplinary research due to lack of collaborations between stakeholders engaged in R&D.
- Karnataka specific research forms a very small proportion of overall research activities and the outputs produced are not consolidated under a common formal platform.

Knowledge Dissemination: Based on analyses of education, health and agricultural systems along with mediums of mass communication in rural and urban Karnataka, strengths and weaknesses have been identified, as listed below.

Strengths:

- The Gross Enrolment Ratio (GER) for Karnataka is higher than the national average and in some districts primary enrolment is almost universal.
- Compared to the national average, Karnataka has a higher number of general colleges and institutions for vocational training.
- EDUSAT has already been established at VTU providing e-learning and distance learning facilities to more than 100 colleges. EDUSAT has not reached majority of States in the country yet.
- Telemedicine facilities have already been established in all district hospitals of the State. It has not yet been introduced in majority of Indian States.
- More than 90 per cent of the villages are connected through wireless network.

- Currently there are 27.69 internet subscribers in Karnataka per 1000 population and it is ahead of the national average and states like Andhra Pradesh, Tamil Nadu and Kerala. Primary survey reveals that people are open and receptive to innovation and ICTs.
- There is a vast network of NGOs in Karnataka which are contributing to the States development through active knowledge dissemination.

Weaknesses:

- Lower transition rate from primary to secondary and secondary to higher education levels - only 34 per cent reach up to higher secondary and less than 10 per cent reach the graduation level.
- In case of secondary and higher levels of Education there is a gender and social disparity as the dropout rate among girls and backward sections of society seems to be comparatively higher.
- Infrastructure gap in the schools, especially with respect to RTE.
- Quality of primary and secondary education in the State needs attention, as determined by various studies including ASER 2010, NUEPA Flash Statistics, KSQAO etc.
- Seats in emerging areas like Biotechnology (in engineering colleges) have excess industrial demand for skilled labour with limited supply partly due to low proportion of government seats allocated to it.
- Shortfall in staffing at the Primary and Community Health Centres.

Knowledge Application: Based on analysis of education, health and agriculture related outcomes and developmental indicators pertaining to rural and urban development, strengths and weaknesses in knowledge application have been identified, as listed below.

Strengths:

- 67 per cent of the population in the state is in the age group of 15-59 years which establishes that the state has a favorable demographic advantage.
- The number of job seekers measured by live register figures of employment exchanges are exhibiting a decreasing trend.
- 'New Industrial Policy, 2009-14' aims to build a prosperous Karnataka through development of human and natural resources in a systematic, scientific and sustainable manner.
- Favourable policy thrust to encourage entrepreneurship and innovation, accompanied by receptiveness amongst the majority for the same (as revealed from Primary data analysis)
- Organic and sustainable farming have gained momentum in recent years.

Weaknesses:

- 55 per cent of the total population is not in the labour force.
- Around 50 per cent of the workers work in the agriculture sector which contributes to only 17% of GDP.
- A large proportion of the State's working population has low education levels with 25% of work force being illiterate and 49% of work force entering the labor market without secondary education.
- Lesser participation of women in the workforce. The contrast is more severe in the urban areas compared to the rural areas.
- Constraints relating to entrepreneurship exist in the areas of insufficient state support for early stage and seed funding, lack of basic and affordable infrastructure such as water, power and roads, etc.

Traditional Knowledge: Based on secondary and primary data analysis including interaction with researchers and academicians, strengths and weaknesses in the areas of traditional/indigenous knowledge collation and development have been identified, as listed below.

Strengths:

- A vast pool of traditional knowledge lies in agriculture, veterinary care, human health, handicrafts, performing arts, religion and astrology.

- Applications of Traditional Knowledge largely in the fields of science, medicine and linguistics form parts of academic curriculum in Karnataka and efforts have been undertaken to document it.
- Knowledge on languages such as Sanskrit and Kannada, Unani and Ayurvedic systems are also disseminated through University departments and Institutions of higher education in the State.
- Research Organisations have also been working towards identifying, assimilating and documenting Traditional Knowledge in the State and outside. For instance, the Centre for Ecological Sciences, IISc, Bangalore in collaboration with several other organizations has developed modules for recording traditional knowledge of local bio-resources in a document, called the “People’s Bio-diversity Register” (PBR).

Weaknesses:

- Institutional arrangements presented constitute only a small portion of the total traditional knowledge pool given the vast pool that the state has in varied forms.
- Traditional Knowledge practitioners are scattered and not easily identifiable and that makes collation and documentation difficult.
- Documentation of knowledge of individuals with regard to biodiversity and its uses is an important part of PBR. In the process, special attention is given to the elderly persons who can also provide indigenous information and focus group discussions are also conducted to collate the same.
- Practitioners of traditional knowledge are not familiar with modern documentation methods and thus they are unable to effectively contribute to assimilation of traditional knowledge.

Roadmap for Knowledge Society in Karnataka

Knowledge creation depends on well-functioning markets - where individuals, investors, owners or managers are motivated through rewards which the application of such knowledge brings. Every society has distinctive assets and deficits; ones which understand their comparative advantage and design the policies to exploit the advantages raise the odds of success.

The educated and trained scientists and researchers, world class institutions and facilities facilitate interactions with global communities to generate fresh ideas and new perspectives. These fuel innovations which create commercial success and help transition towards the knowledge based society. Globalisation has accelerated the pace at which skills requirement change, a highly educated workforce is critical to support innovation and transition from industrial to knowledge-based economy and society.

Therefore, initially the challenge for Karnataka in its journey towards a knowledge based society, is not so much in developing world class institutions and trained researchers, but it would be in lifting a large population from relatively disadvantage position and bring them to a level where they can positively contribute to economy and society. The roadmap developed for the transformation looks to achieve this in three phases – Inclusion, Expansion and Excellence.

Inclusion: The first stage in the transition is “**Inclusion**” wherein the initiatives are focused around achieving Universal access and equity. This involves a multidimensional, multi sectoral and equitable growth and development process. This involves building the basic foundation required in the five core sectors for knowledge society. The outcomes desired at the end of this stage include achieving 100% primary education level enrolment, functional literacy, achieving basic health and nutrition targets, introduction of Good Agricultural Practices¹, elimination of gender disparity, livelihood diversification in rural areas and improving accessibility of urban infrastructure.

Expansion: The second stage in the transition towards a Knowledge Society is “**Expansion**” wherein the focus is on sharing of knowledge, building on experiences and application of knowledge to create talent pools, creating competitive advantage in chosen areas. While the central theme in Inclusion stage would be on “Access” it moves to “Participation” in Expansion stage. The outcomes in this stage would be revolving

¹ Good Agriculture Practices is a concept defined by defined by the Food and Agriculture Organization (FAO) of the United Nations

around the success stories in research and development, number of skilled personnel to meet industry demands, improvement in health and nutrition indicators, reduction in rural ~ urban socio-economic disparities and increasing contribution of knowledge based activities in the economy for the state of Karnataka.

Excellence: The last stage in transition is creating a continuous process of learning and development to create a society which not only meets the need of state but significantly contributes at national and global level. This entail integration with other knowledge societies and creating centres of excellence in the chosen areas. The outcomes in this stage would be revolving around innovations and research on sustainable development of mankind and environment, seamless sharing of knowledge and integration of Karnataka as a Knowledge Society with other vibrant national and global societies.

While the transition is divided into three stages, due to geographical and social disparities within the state, the Inclusion and Expansion stage coexist. For instance, while the issue of universal access to education is being addressed there would be simultaneous actions to improve the research and skill building to meet the industry requirements. The recommendations made herein cover the Inclusion and Expansion phases where the focus is to bring the society to a level of threshold knowledge where it is able to find these comparative advantages and pursue them earnestly to attain excellence.

Recommendations are provided for the five sectors separately and are largely focussed on propelling social inclusion and expansion in Karnataka. The chart for progression is formulated for the period of 2011 -2020 and leading to excellence and lifelong learning. Recommendations are derived from best practices, success stories and case studies nationally as well as globally² e.g. latest dialogues on quality education, example studies and experiences of World Bank initiatives, Social campaigns and success stories from India etc and cross cutting aspects like ICTs, private participation and innovation are also covered where relevant. Apart from a series of broad recommendations suggested in the study, certain specific recommendations have been included for each sector. The key imperatives to be achieved in each of the sector are:

Education:

- a) Universal functional education
- b) Improvement in quality of education and learning levels
- c) Link education and skill building to market requirements
- d) Channelling research into right areas and creating centres of excellence in areas of comparative advantage

Health:

- a) Universal and affordable healthcare
- b) Improvement in service delivery through appropriate staffing, capacity building, monitoring and reporting procedures.
- c) Universal access to knowledge on basic health aspects like institutional delivery, child nutrition and development, hygiene, good practices on sanitation etc.
- d) Channelling ICTs and private engagements to reach out to the difficult to reach populations.
- e) Promotion of Medical Education by strengthening existing institutes and establishment of new centres of public health education, which undertake research and training.

² A list of selected global best practices and success stories is provided in Appendix VI.

Agriculture:

- a) Higher productivity and output per worker
- b) Spread of innovation in agriculture and related practices
- c) Channelling research into right areas and creating centres of excellence in areas of comparative advantage

Urban Development:

- a) Livelihood Enhancement
- b) Development of social, technical and intellectual capital and infrastructure in Tier I and Tier II cities of Karnataka
- c) Development of satellite urban centers in the State
- d) Improvement in policy thrust and opportunities for Entrepreneurship Development
- e) Strengthening the facilities and infrastructure for pursuing research and development

Rural Development:

- a) Enhanced entrepreneurship and livelihood diversification in the rural economy (including rural farm and non-farm sector)
- b) Link villagers, academicians, researchers and industry players through appropriate knowledge sharing
- c) Documentation and development Traditional Knowledge

Knowledge Index - Finally, the analysis indicates that there exist geographical, gender and class disparities in access to knowledge. The study also reveals that small pockets of excellence in knowledge co-exist with absolute ignorance and low level of knowledge and skill amongst a large population in Karnataka. Transformation of Karnataka into a Knowledge Society would require the majority of the population achieving basic level of education with no disparities amongst them in accessing and using the knowledge as the presence of knowledge is central to theme of any Knowledge Society. In this context tracking performance of the individual districts in Karnataka becomes imperative based on selected parameters and key performance indicators to measure the progress made towards achieving the vision of transforming into a Knowledge Society.

In order to conceptualise the Index the study covers the formulation of a “District wise -Creation-Application-Dissemination Index (**D-CAD Index**)”. It is expected that D-CAD Index will aid in identifying resources and means for their effective application at various levels – both in terms of geographical distribution and enriching specific domains. D-CAD Index aims to calculate the status of knowledge across all the districts and which can be aggregated to calculate the same at the state level. It is based on a ‘District focused Approach’ for policy implications and identifications of areas of need for government intervention. It takes into account twenty one odd parameters like GDP, Life Expectancy at birth, employment rates, dropout rates, number of libraries, Anganwadi centres, traditional knowledge assimilation, amongst others.

The implementation of the recommendations would require the state government to work in coordination with different bodies like Departments of Elementary, Higher and Technical Education, Department of Health, Department of Agriculture, Universities, autonomous research institutes, Industrial bodies and consortiums, Directorate of Vocational Training, etc. An effective approach to incorporate a robust structure of management and communication of Knowledge in the areas identified can result into the attainment of a vibrant knowledge society in the state and the current study strives to be an important step towards it.

Abbreviations

ASER	Annual Status of Education Report published by Pratham
CSR	Corporate Social Responsibility
DCE	Department of Collegiate Education
DISE	District Information System for Education
EDI	Education Development Index
EDUSAT	Education Satellite
KJA	Karnataka Jnana Aayoga
KKC	Karnataka Knowledge Commission
KSQAO	Karnataka State Quality Assurance Organisation
KVK	Krishi Vigyan Kendra
KVIB	Khadi and Village Industry Board
KVIC	Khadi and Village Industry Commission
MoHFW	Ministry of Health & Family Welfare
MHRD	Ministry of Human Resource Development
MIS	Management Information Systems
NGO	Non Governmental Organisation
NIAS	National Institute of Advanced Studies
NRHM	National Rural Health Mission
NSDC	National Skill Development Corporation
NSSO	National Statistical Survey Organisation
PBR	People Biodiversity Register
PHC	Primary Health Centre
PTR	Pupil Teacher Ratio
RMSA	Rashtriya Madhyamik Shiksha Abhiyan
RTE	Right To Education
RSK	Raitha Samparka Kendra
TRAI	Telecom Regulatory Authority of India
VTU	Visvesvarya Technological University
WPR	Worker Population Ratio

Introduction

Background

The structural composition of employment in Karnataka shows that a large proportion of its workforce continues to remain in traditional and low-productive sectors, which translates into low income growths and slow reduction in poverty levels. As per the 61st Round of NSSO survey, only 3% of rural population and 16% of the urban population have a degree, diploma or a certification in Karnataka. This means that large proportion of the State's population has not pursued higher education, nor have they been formally certified for a skill. To ensure that the poor are able to enhance their capability and benefit from emerging opportunities, they will have to possess appropriate skills and competencies. As per Karnataka Vision 2020, the State needs to undertake massive efforts for skill development of its workforce and proper channelization of knowledge through involvement of all sections of the society.

The State constituted the Karnataka Jnana Aayoga also referred to as the Karnataka Knowledge Commission (KKC) in September 2008 to look into the issues related to creation, dissemination and application of knowledge within its periphery. KKC is a high-powered commission and functions under the aegis of the Office of the Chief Minister of Karnataka. The overarching aim of KKC is to enable the development of a vibrant knowledge based society in Karnataka. This not only entails a radical improvement in existing systems of knowledge creation, dissemination and application but also greater participation and more equitable access to relevant knowledge across all sections of society. There is now a need for better understanding of the components of a knowledge society, especially given the development realities of Karnataka and it is in this context that the present study instituted by the KKC assumes significance.

In this context, KKC has awarded the assignment to conduct a study on "Building Knowledge Society in Karnataka" to PwC through Office Order No. 10 dated March 26, 2010. As a contractual requirement, we are submitting this final report covering all the aspects of the study and key recommendations.

Vision 2020 and Beyond

The objective of the Vision 2020 is to undertake initiatives in a planned and structured manner for the overall development of Karnataka. The Vision 2020 emphasizes on the importance of building the State of Karnataka as a vibrant Knowledge Society. The recommendations and targets in this respect are focussed on improving the quality of school education and thrust on enriching higher education. In addition, the Vision document also provides recommendations in the areas of rural livelihood, skill development, healthcare, industrialization, urbanization, empowerment of women, energy availability, culture and heritage, environment and improved governance.

Developing Karnataka as a vibrant knowledge society will, therefore, entail taking a holistic approach which covers not only educational enhancement, promotion of high-technology industries or information and communication technologies (ICTs), but also how it's various economic structures harness and use newer and existing knowledge to improve the productivity of agriculture, industry, and services and increase overall welfare of its people. As noted in the Karnataka Vision 2020 document, a great potential exists for increasing productivity by shifting labour from low productivity and subsistence activities in agriculture, informal industry, and informal service activities to more productive modern sectors, as well as to new knowledge-based activities—and in doing so, to reduce poverty and touch every member of society. The study focuses on the five core sectors of Education, Health, Agriculture, Rural Development and Urban Development.

Education: helps to develop a person's capability for learning, for interpreting information, and for adapting knowledge to local conditions. At the same time, it affects economic productivity and other aspects of life like health and nutrition, self confidence and overall well being. Hence, education is a pre-requisite and an enabler

for the development of a knowledge society. It is very important that the Education System in Karnataka strives to develop Life-long learning skills amongst its students, which could enable continuous acquisition and application of knowledge through the life-time of the empowered individuals.

Health: Sustained improvement in the health indicators warrant a comprehensive approach encompassing education, health and socio economic issues such as age of marriage, child bearing practices, traditional child rearing, sanitation standards, nutrition levels and gender inequality. The universal principles of primary healthcare emphasize on synergy between all segments of health care through community participation, use of appropriate technology, equitable distribution and inter-sectoral coordination. It emphasises the need for health workers at all levels, especially at the grass roots to understand these linkages and determinants of health. Thus, the achievement of Vision 2020 goals in the health sector will be closely linked to knowledge related interventions that foster an environment that encourages the creation, sharing, and effective application of knowledge to improve health of the citizens.

Agriculture: continues to be the major source of livelihood for the majority of Karnataka's rural population. However, with the changing composition of GSDP, wherein the contribution from agriculture is gradually declining, the main challenge for the sector lies in making it a viable and sustainable source of income for those dependent on farming. In order for the State to meet the Vision 2020 targets of more than doubling output per worker, increasing the agricultural growth rate from 0.8% to 3-4%, more than doubling of yield of coarse cereals and reducing rural poverty level from 20.8% to less than 5%, effective and efficient access, creation and application of knowledge will be a key enabler.

Rural Development: With over 66 percent of its population residing in rural areas, Rural Development is imperative for the overall development of the State. Agriculture and the non-farm sector forms the backbone of the rural economy in Karnataka. The major challenges faced by the State in the area of rural development include rural housing, livelihood, water supply and sanitation and local governance. Infrastructure in rural areas, including roads, storage and marketing facilities, is essential for increasing productivity of land, reducing post harvest losses, providing access to markets and improving living standards.

Urban Development: Karnataka's urban population witnessed a growth of 29% between 1991 and 2001, making it the fourth most urbanized among the major states in India with about 34% of its population living in urban areas. The Vision 2020 for Karnataka targets to reduce urban poverty from 32.8% to below 10%; provide 100% access to safe drinking water, sanitation and drainage facilities, electricity as well as access to commercial energy sources. The realization of these targets critically depends on empowerment of citizen's through knowledge related interventions to enable them to participate in building the facilities and infrastructure they desire in their localities. Recent shift of IT investment focus from major cities to smaller towns have augured well for a number of urban centers like Mangalore, Mysore, Belgaum, etc. Creating infrastructure and environment conducive to attract and support investment in knowledge based industries is required to further enhance the urban development in the State.

Objective and Coverage of the Study

The primary objective of this study is to define the elements of a knowledge society, assess the status of these elements in the context of Karnataka, identify the gaps and propose specific recommendations that are required to transform the state into a vibrant knowledge society. The components of the study covered in this report are organised into following themes:

- Understand the Concept of Knowledge and Knowledge Society
- Design Framework and current assessment organized into knowledge creation, dissemination and application
- Roadmap to build a Knowledge Society
- Role and importance of Traditional Knowledge

Research Methodology for the Study

The key mode of assessment in this study has been secondary research supported by a primary survey.

Secondary research involved data collected from web portals of government departments and ministries, universities and academic institutions, district authorities in Karnataka and reports published by multi-lateral development agencies like World Bank, UNDP, UNESCO, etc.

This study would have been incomplete without getting a flavor of public opinion and gauging the attitudes and opinions of stakeholders from different stratum of the society. A primary survey of 1230 respondents seeks to fulfill this and supports our secondary analysis. Primary data for this study was collected through a survey conducted across various stakeholder groups in the five identified sectors, namely, Health, Education, Agriculture, Rural Development and Urban Development. A total of 1230 respondents were covered as a part of the primary survey comprising of direct beneficiaries/ end users, government service providers, private service providers, department functionaries and other stakeholders including civil society representatives, academicians and sector experts. The survey covered 1001 beneficiaries, 200 service providers and 30 researchers, academicians and policy planners spread over 8 districts under study.

Design of Survey Instruments/ Questionnaires:

- This study involved interactions with three key stakeholder groups – beneficiaries, service providers and researchers/policy makers. Respondents belonged to one of the five sectors covered in the study
- For beneficiaries, one generic questionnaire was administered to all respondents across all sectors to which respondents provided sector specific responses.
- For Researchers/ Policy planners, a generic questionnaire was administered for all respondents in this group. While most questions were structured and close ended, there were a few open-ended questions.
- Focus Group Discussions were conducted with beneficiaries and service providers, from each sector under study, in order to elicit more specific information from the stakeholders.

Sample Design:

A stratified sample was taken from the historical-geographical regions in the State – Hyderabad Karnataka, Bombay Karnataka, Coastal and Malnad region, and Southern Maidan for survey. For the selection of the districts within each region, the HDI rankings were used as an indicator. In this study, from each region, the district with the highest and lowest HDI ranking was selected. Eight districts and sixteen taluks were covered during the primary survey³. As seen in the table, the sample included two districts with high overall HDI (rank 1 and 2); three districts with medium HDI (ranks 7, 11 and 18); and three low HDI districts (ranks 23, 25 and 27). Further,

- In each of the eight districts selected, a total of fifteen locations were covered. Of this 10 were rural and 5 urban locations.
- In each of the eight districts, two taluks were covered through random selection, totalling sixteen taluks

Region	District	Taluk
Bombay Karnataka	Belgaum (8)	Belgaum
		Chikodi
	Bijapur (23)	Bijapur
		Muddebihal
Hyderabad Karnataka	Bellary (18)	Bellary
		Sandur
	Raichur (27)	Raichur
		Manvi
Coastal and Malnad	Dakshin Kannada (2)	Mangalore
		Puttur
	Hassan (11)	Arasikere
		Hole Narsipur
Southern Maidan	Bangalore Urban (1)	Bangalore North
		Bangalore South
	Chamrajnagar (25)	Chamrajnagar
		Kollegal

³ The respective district HDI ranking are provided in parenthesis

across the selected districts. In each of the sixteen taluks, five rural and at least two urban locations were covered.

- The selection of the villages was done to ensure coverage of five separate hoblis in taluks with more than five hoblis and all hoblis in taluks with less than five hoblis.

The following map depicts the geographical spread of the survey locations, the districts and taluks that were covered in the survey, which have been highlighted in green.

Figure 1: Geographical Spread of Survey Locations



The profiles of the respondents across sectors and other sampling based details are explained in a separate section at Appendix I and the Questionnaires used is attached at Annexure VII.

The Concept of Knowledge in the context of Karnataka

Interpretation and Characteristics of Knowledge

Knowledge is a key component of all economic, social, cultural and human activities. Knowledge is the driver of growth and propeller of a distinctive identity for a Society, one that is unique in nature.

- **Ancient Indian Scriptures:** Knowledge enables an intimate communion with the essence of reality and facilitates an understanding of this reality for the development/ realisation of the self. This realisation of the self is a vehicle for societal development. The Sanskrit term *Jnana* that commonly translates to knowledge, comprehension or wisdom, has been often used to refer to two kinds of knowledge; knowledge of the temporal world, and to the intuitive insight into the Ultimate Real that accompanies *moksha* or liberation.
- **Other Interpretations:** Over the years, Knowledge has been defined in myriad fashions by philosophies, religions and societies. The basis of the term remains that Knowledge is a true and well-justified belief or proposition. Knowledge is achieved, at least from a standard empiricist view, by some learning process, either through perception or through the adoption of such a tradition that contains previously gathered knowledge. It has also been defined as the sum or range of what has been perceived, discovered, or learned; as the state or fact of knowing. Pragmatically, knowledge can be considered as an understanding based on experience that can be shared or communicated and provides 'capacity for effective action'⁴. Thus, knowledge necessarily leads to a process of transformation through the human mind.
- **Multidimensionality of Knowledge:** The concept of knowledge includes different ways of thinking and is not restricted to empirical evidence or monolithic views of only scientific phenomenon and rationality. Human experience spans different realms of meaning, and knowledge exists in different forms with diverse ways of knowing. Other forms of human experience – liberal arts, humanistic studies, creative endeavours like music, dance, drama, etc., also qualify to be considered as knowledge or pursuit of truth.
- **Knowledge can be Explicit or Tacit in nature:** Explicit knowledge is recordable, can be transferred systematically, is seen to be objective and can even subsist, awaiting discovery, without being known⁵. However, there exists a large body of knowledge that is tacit, embedded in the minds and bodies of human individuals, perhaps semi-consciously and often not easily transferred to others. Tacit knowledge includes skills or capabilities and is generally considered to be of a personal nature.
- **Knowledge Societies not limited to Information Societies:** Knowledge is internalised information. It is integrated within the person's cognitive structures. In order for information to be turned into knowledge, there must be a presence of pre-existing structures of understanding in the memory, which are capable of retaining certain information so that it can come to form part of the knowledge of a

⁴ Reilly, C. "The Concept of Knowledge in KM: a Relational Model." The Electronic Journal of Knowledge Management Volume 7 Issue 1 2009, pp. 145 - 154

⁵ Nonaka, Ikujiro and Takeuchi Hirotaka "The knowledge-creating company: How Japanese companies create the dynamics of Innovation". Oxford University Press, 1995

person”⁶. A data base can contain information - that is, organized data - but for this data to become knowledge, it must be appropriated and confronted by reality⁷.

- **Ways of Knowledge Transfer:** Knowledge communication entails successful transfer of know-how (e.g., how to accomplish a task), know-why (e.g., the cause-effect relationships of a complex phenomenon), know-what (e.g., the results of a test), and know-who (e.g., the experiences with others) through face-to-face (co-located) or media-based (virtual) interactions. The efficient and effective transfer of experiences, insights, and know-how among different stakeholders is a prerequisite for high-quality decision making and coordinated, organizational action⁸.
- **Traditional or Indigenous Knowledge:** An important component of any society’s knowledge system is the knowledge within its people. Indigenous Knowledge encompasses the skills, experiences and insights of people, applied to maintain or improve their livelihood. As per a World Bank report, indigenous/ traditional knowledge is relevant on three levels in a country’s development process:
 - It is most important for the local community in which the bearers of such knowledge live and produce.
 - Development agents (CBOs, NGOs, governments, donors, local leaders, and private sector initiatives) need to recognize it, value it and appreciate it in their interaction with the local communities. Before incorporating it in their approaches, they need to understand it – and critically validate it against the usefulness for their intended objectives.
 - Lastly, indigenous knowledge forms part of the global knowledge. In this context, it has a value and relevance in itself. Indigenous knowledge can be preserved, transferred, or adopted and adapted elsewhere.

What is a Knowledge Society?

A Knowledge Society is centred on Knowledge for its development. It can be built when the inherent and new knowledge of a State rhythmically translates into competitiveness, productivity, social welfare, good governance and human development.

In contrast to labour or capital that constitutes the dominant resource of societies, Knowledge Societies are centred on knowledge. The capacity to use knowledge effectively allows individuals, organizations and societies to utilize their resources better improve their well-being and contribute to overall development of society. Some of the key contributions of knowledge to economic and social development are in its role as a⁹:

- Driver of competitiveness and productivity
- Facilitator of welfare and environment
- Enabler of institutions and governance

In order to obtain a clearer understanding of the key features of a knowledge society, a literature review was undertaken, primarily with reference to studies by prominent national and international organizations in the development field. These organizations, such as the United Nations Development Programme (UNDP), United Nations Educational, Scientific and Cultural Organization (UNESCO), the World Bank etc. have

⁶ Bretx (1971)

⁷ Burch, Sally, “Knowledge sharing for rural development: challenges, experience and methods”, 2007, Latin American Information Agency

⁸ Straub, D., Karahanna, E. (1998). Knowledge Worker Communications and Recipient Availability: Toward a Task Closure Explanation of Media Choice. Organization Science 9(2), 160-175.

⁹ Building knowledge economies: advanced strategies for development, (2007), World Bank Institute, Knowledge for Development Programme

proposed their frameworks based on their extensive collated experience across several regions and countries. In the Indian scenario, the recommendations of the National Knowledge Commission have been considered as a more contextual benchmark for developing a knowledge society. A summary of the key insights is provided below.

- **UNESCO's 2005 World Report, 'Towards Knowledge Societies'**: Knowledge societies are about capabilities to identify, produce, process, transform, disseminate and use information to build and apply knowledge for human development. It has identified three pillars of a knowledge society, which are:
 - Better enhancement of the value of existing forms of knowledge to narrow the knowledge divide
 - More participatory knowledge societies
 - Better integration of knowledge policies
- **United Nations Development Programme (UNDP)**: has highlighted the following as key characteristics of a knowledge society
 - Provision of enabling environments,
 - Deployment in the service of human development
 - Transfer and indigenization of knowledge
- **World Bank**: states that social and economic progress is achieved principally through the advancement and application of knowledge, and consequently, knowledge and innovation-related policies should be at the core of developmental strategies. A knowledge society is based on four pillars:
 - Educated and skilled workers
 - A dynamic information and telecommunications infrastructure
 - An efficient innovation system
 - A strong business and governance framework.
- **Organisation for Economic Co-operation and Development (OECD)**: states that knowledge-based economies are those which are based on:
 - Production of knowledge
 - Distribution of knowledge
 - Using of knowledge and information

The success of economies is reliant upon their effectiveness in gathering and utilizing knowledge. Knowledge and competence are developed interactively and shared within sub-groups and networks, where know-who is significant. The economy becomes a hierarchy of networks, driven by the acceleration in the rate of change and the rate of learning. What is created is a network society, where the opportunity and capability to get access to and join knowledge and learning-intensive relations determines the socio-economic position of individuals and firms.

- **European Foundation**: says that a knowledge society has been taken to mean at least two distinct but related ideas, which are :
 - To describe trends and developments those are already apparent. As a descriptive term, knowledge society is meant to point to new dynamics of industrial growth and innovation experienced in recent decades.
 - To envision potential directions of development, opportunities that can be grasped to do things in new and better ways. Knowledge society ideas are used by all national governments in expressing their aims for their societies, as the route to renewed growth, greater prosperity and better quality

jobs. This sense of the term is manifest in the Lisbon Council's Objectives¹⁰ and many national government documents.

- **The National Knowledge Commission (NKC) of India:** has developed a framework for the creation of a knowledge society, which adopts a more India centric-approach. The NKC framework is centred on five aspects¹¹, namely,
 - Creation of knowledge – Producing or acquiring new knowledge and preserving existing knowledge
 - Access to knowledge - Expanding the reach of knowledge in society and ensuring that all sections have access to both knowledge and its applications
 - Knowledge Concepts - Knowledge concepts to be organised and disseminated through the education system
 - Knowledge Applications – Facilitating the productive application of knowledge to promote technological change, enhance quality of life and facilitate reliable and regular flow of information.
 - Delivery of Services - Ensuring accountability, transparency and proficiency in service delivery through knowledge applications

What distinguishes a Knowledge Society from others?

Knowledge exists in all. A Knowledge Society distinguishes itself from other type of societies by empowering its citizens through universalising access, ensuring equity and promoting new knowledge generation.

A large part of the literature on Knowledge Society links it with other widely used concepts/definitions such as information society, knowledge economy, networked society, digital society, technology society etc. In particular, more frequent debates arise on comparing concepts of information society and knowledge economy to the attributes of a knowledge society. As the UNDP¹² report aptly states, the connotations of the term 'knowledge' differ between them. In any knowledge society, it is not only the means (technologies) to spread it that need to be taken into account, but it also encompasses the ends - a (value-based) human capital development to make it effective. The concept of a knowledge society is broader than the other concepts being more embracing and conducive to equity and empowerment. In fact the final purpose of a knowledge society is to enhance value for the people and emphasizes on entrepreneurship, innovation, environmental awareness, and also development of values.¹³

The present study realises the importance of understanding the intrinsic characteristics of a Knowledge Society to chart the path for transition towards the same. Based on discussions with stakeholders¹⁴ and literature review the five key characteristics defined are:

- There exists Knowledge in all [**Universal Presence**]
- Knowledge is available to all [**Universal Access**]
- Knowledge is equally accessible to all [**Equity in Access**]
- Bottom Up Approach to empower the society's citizens [**Knowledge Empowerment**]
- Continuous process of learning, development and knowledge generation [**Lifelong Learning**]

¹⁰ The Lisbon Council of March 2000 aimed to invigorate the European Community's policies and to define long-term targets and measures. The Council resulted in the 'Lisbon objectives'. These specify that the European Union should, by 2010, 'become the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion.'

¹¹ <http://www.knowledgecommission.gov.in/about/default.asp>

¹² Arab Knowledge Report 2009 – Towards productive intercommunication of Knowledge, 2009, UNDP

¹³ Drawn from Naumanen, Mika, (2003), *Knowledge Society Barometer*

¹⁴ Drawn from Knowledge Pyramid suggested by Dr MK Sridhar, Member Secretary of Karnataka Knowledge Commission and PwC internal consultations

1. **Universal Presence:** Each individual has a knowledge set which develops with age, education, experiences, lessons learnt etc. This knowledge, intrinsic in a society and its people needs to be acknowledged, understood and further developed through appropriate systems, processes and structures for capacity building in all areas. A Knowledge Society develops the capacities latent in human nature and integrates their expressions to foster development.
2. **Universal Access:** Existing and new knowledge on various sectors and aspects of the society needs to be accessible to all. Systems and processes for knowledge transfer should be widespread and well connected for this purpose.
3. **Equity in Access:** The access and availability of resources should be equitable and should cater to all irrespective of age, class, socio-economic, political or religious background, location etc.
4. **Knowledge Empowerment:** In a Knowledge Society intrinsic knowledge is valued, new knowledge percolates the society in an equitable manner, and the citizens at the grass root level are connected, informed and receptive to changing times and technologies. This is facilitated through Bottom Up and demand driven approaches, structures and systems – that lead to empowerment and progression towards the visionary state.
5. **Lifelong Learning:** is an intrinsic part of Knowledge societies, leading to continuous progress and development.

Figure 2: Characteristics of a Knowledge Society



Key Components of a Knowledge Society

Knowledge remains an abstract concept and to capture the flow and trends of knowledge in Knowledge Society a theoretical breakdown of it is vital. The three broad components of Creation, Dissemination and Application of Knowledge form the basis for this.

▪ **Knowledge Creation:** Engagements for producing new Knowledge

Knowledge is the focal point of knowledge societies where producing or acquiring new knowledge and developing and preserving existing knowledge are essential requirements. This makes the society responsive to the changing needs of its people. In the present study Knowledge Creation covers engagements that are undertaken for production of new knowledge and developing and securing of existing knowledge. It is important to identify these activities to ensure that the State is working towards building a sustainable future and consolidating the lessons learnt in the past.

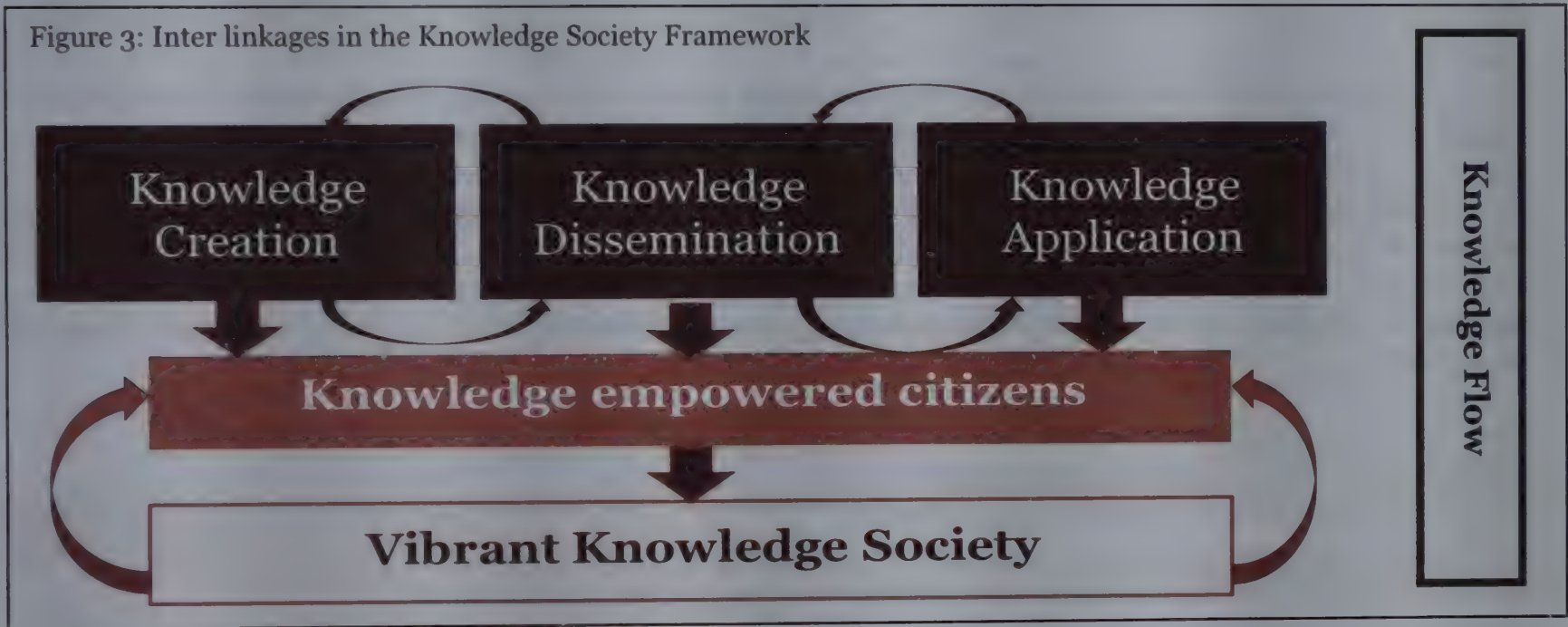
▪ **Knowledge Dissemination:** Engagements for spreading and sharing Knowledge

Providing access to knowledge increases opportunities for people to engage in more productive activities. It is, therefore, essential to expand the reach of knowledge in society and to ensure that all sections of the society have unrestricted access to it. This, in turn necessitates the presence of effective channels and mechanisms to disseminate the knowledge that has been created or acquired by society. These channels could be either formal mechanism such as education systems or they more informal channels of dissemination such as the communication of oral traditions between generations.

▪ **Knowledge Application:** Engagements for transforming knowledge into effective action

The third component of the framework relates to the application of knowledge. It is here that knowledge is transformed into productively beneficial uses and activities. Investment in production of new knowledge and its subsequent dissemination should accelerate both economic growth and human development through the application of knowledge. In this respect, both quantitative and qualitative aspects of knowledge applications are important. Not only should application of knowledge take place on a wide scale and should eventual enhance the socio economic patterns of the society.

Inter-linkages between Knowledge Creation, Dissemination & Application: While three components of knowledge society have been described, it is important to recognize that there is significant degree of interactions and overlap between them in reality. For instance, knowledge creation through research and innovation is significantly dependent on the systems of education, health, agriculture etc for knowledge dissemination and communication. Once the knowledge is passed on to the masses or disseminated, it needs to be applied in day to day lives in the form of effective action. It also needs to be applied in various sectors and industries to produce outputs. This is the stage of knowledge application, which again leads to development of new and effective technologies and further knowledge creation through myriad learning generated from experience. The State requires a holistic development such that each citizen is empowered with knowledge through effective creation, dissemination and application. It is only through fostering individual knowledge capabilities that the overall knowledge capability of the state can be developed. The entire knowledge flow, permeating through these inter linkages is illustrated below.



Knowledge Creation in Karnataka

Knowledge Creation i.e. producing or acquiring new knowledge and developing existing knowledge is an essential requirement of all knowledge based societies.

Overview: Knowledge Creation is essential part of the society's response to the changing needs of its people. New Knowledge created through extensive activities of Research and Development (R&D) are channelized to various sections of the society and has implications on education, health, agriculture, industries etc which eventually fosters rural as well as urban development. Research outcomes can lead to path breaking improvements in the society and to ensure this, research studies need to be aligned with requirements of the specific disciplines that can further lead to human development goals e.g. research in medicines can lead to effective treatment of diseases and local flu and illnesses. This can contribute to advancement in medical field as well as address local problems of the State. Moreover research in Agricultural Sciences can lead to innovative means of crop cultivation, fertilisation or irrigation for local farmers along with propelling the advancement of the science.

Brief History of Knowledge Creation: Karnataka has rich heritage and culture where knowledge and creativity has found a generous expression in varied forms of literature, art, architecture, medicine etc. Literary forms in Sanskrit and Kannada languages, music in its classical form, architectural traditions among others reflect the different dimensions of the Karnataka genius in the realm of knowledge. The beginning of formal higher learning institutions in Karnataka can be traced back to the late 1800s when a few colleges affiliated to University of Madras were established in the erstwhile Mysore Province. In present times, Karnataka is home to around 32 universities (including central, state and deemed) accompanied by an equal number of government and corporate research organisations which foster creation of knowledge and higher learning not only in the areas of standard academic importance but also in a vast variety of subject areas ranging in the fields of art, architecture, technology, renewable energy, bio medicine, yoga, sericulture and several others.

Core areas covered in the study:

To quantify Knowledge Creation and R&D endeavours that have already been undertaken in the State, reference has been drawn from the United Nations' Report on Human Development Report (2005) which has defined key input and output parameters to assess research capabilities of countries. The core areas covered as part of assessment of knowledge creation in the present section are:

Table 1: Key Output/ Input Research parameters selected by UN HDR 2005

Output Parameters	Input Parameters
Patents granted to residents	Researchers in R&D

Input Parameters of Knowledge Creation:

- Institutions engaged in Research (Higher Educational Institutions, Research Institutions, Independent Research Organisations, Corporate R&D Institutions) and there district wise mapping
- Researchers in Karnataka (pool of students enrolled in higher education especially doctoral studies), demand and supply of researchers, quality of researchers, use of digital media etc.
- Collaborations between Researchers, Government and grass root level users.

Output Parameters of Knowledge Creation:

- Patent trends in Karnataka compared to other states
- Private Participation in Research and Corporate R&D Products
- Research Papers

Input Parameters of Knowledge Creation

Creation of new knowledge largely depends upon the quantity and quality of research conducted. Institutions, human resources, systems and collaborative networks act as key input parameters for evaluating the present status of knowledge creation in the State and understanding its requirements.

Institutions engaged in Research

Karnataka has an amalgam of Premier Institutions of education and research that foster Knowledge Creation.

Educational Institutions in Research & Higher Learning: The State has 37 Universities¹⁵ consisting of Central, State as well as Deemed Universities¹⁶. Premier Institutions in Karnataka include Indian Institute of Science, Indian Institute of Management, National Institute of Technology Karnataka, National Law School of India University, National Institute of Mental Health and Neuro-Sciences (NIMHANS), etc. In addition, an Indian Institute of Technology (Muddenahalli) had been approved by the Government as part of the 11th 5 year plan, which would be the first IIT in the State. Further, Visvesvaraya Institute of Advanced Technology (VIAT) being constructed adjacent to the proposed IIT will focus on research in embedded technology, software quality, agricultural engineering and bioengineering. Each department is expected to function as a ‘Discovery-Innovation Centre.’

Universities and affiliated colleges are key centers for academic research. Even literature from National Knowledge Commission has identified universities as natural home of research and that research in universities is essential for pursuit of academic excellence. The districts in Karnataka which have the presence of University campuses are listed below (Table 2) accompanied by the number of Engineering and Medical colleges.

Table 2: Districts with University campuses in Karnataka

District Name	No. of Universities (inc Deemed)	Degree Colleges	Engineering Colleges	Medical Colleges - Allopathic	Medical Colleges - Indian System	Medical Colleges – Dental
Bangalore(U)	11	65	63	6	9	16
Davanagere	1	21	3	2	1	2
Kolar	1	10	2	1	0	1
Tumkur	2	23	8	0	2	1
Shimoga	1	21	2	1	2	1
Dakshin Kannada	3	35	17	4	4	5
Mysore	4	32	9	1	3	2
Udupi	1	24	2	1	5	1
Belgaum	3	48	8	1	11	2
Bijapur	2	21	4	3	5	1
Dharwad	3	25	3	1	5	1
Bellary	2	20	4	1	2	1
Bidar	1	18	3	1	2	2
Gulbarga	2	31	4	2	4	2

Source: Karnataka at a Glance Document (2009-10)

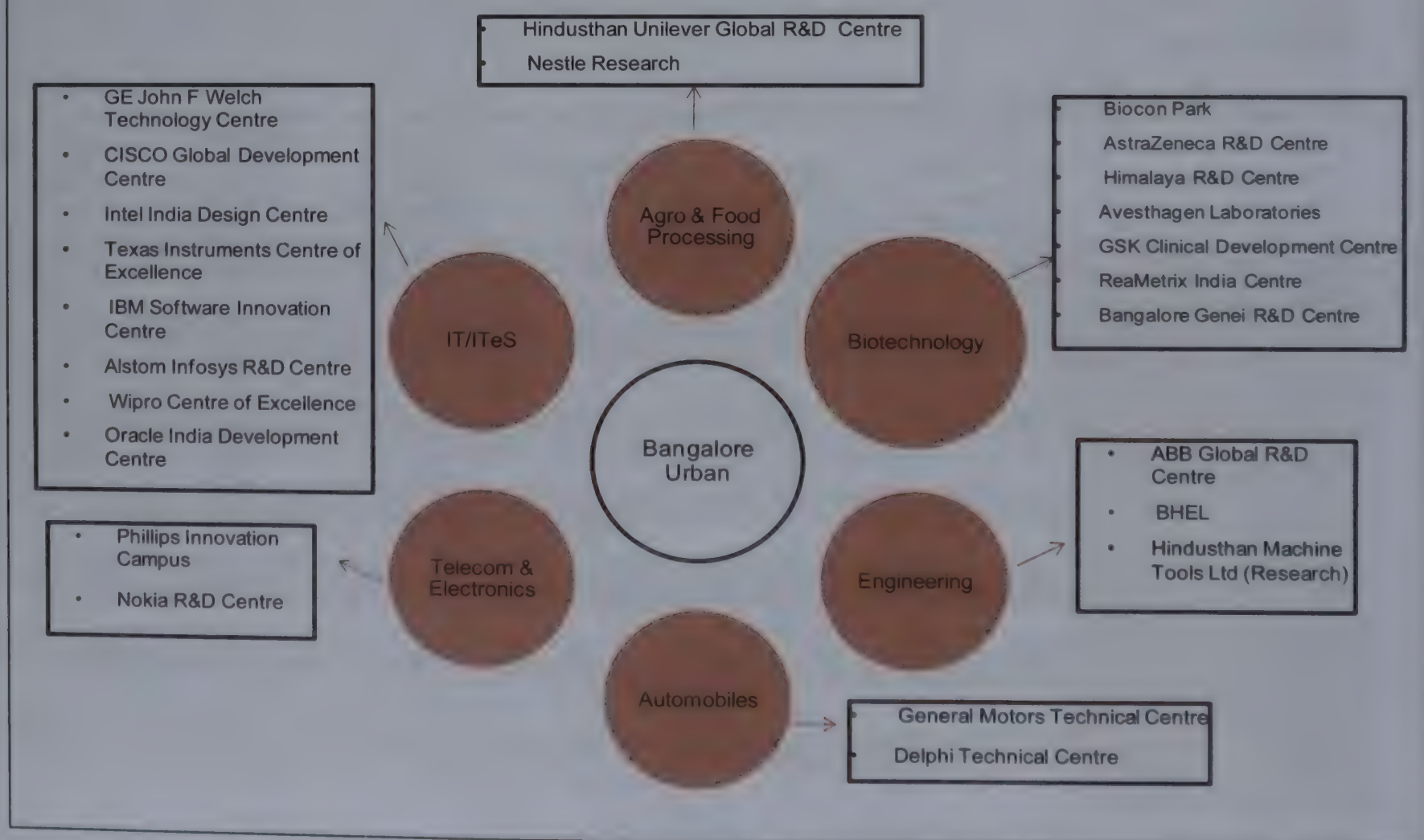
¹⁵ Karnataka at a Glance document (2009 – 10)
¹⁶ List of Universities collated from Secondary data is attached in Annexure III

It is observed that there are district wise variations in the number and spread of Universities. **Bangalore Urban** has the largest base of Academic Institutions in Karnataka. Other districts like **Dakshin Kannada** and **Belgaum** also stand out with relatively large presence of Engineering and Medical colleges respectively. In addition, districts of **Davanagere, Kolar, Tumkur, Shimoga, Mysore, Udupi, Bijapur, Dharwad, Bellary, Bidar and Gulbarga** have University bases, pooling into research. The academic strengths of these districts can be further exploited for propelling Knowledge Creation in the State.

Independent Research Organisations: A large number of independent organisations have come up in recent years which not only support research activities undertaken by the State government and educational institutions but are also pioneering initiatives on global issues. The State is home to several Independent Research Organisations and Societies such as Institute for Social and Economic Change, National Institute of Advanced Studies, Ashoka Trust for Research in Ecology and the Environment (ATREE), Vitthal Malaya Scientific Research Foundation, Aeronautical Research Institutions etc.¹⁷ Most of these organisations are based in Bangalore.

Corporate R&D Organisations: They are well funded, with a large resource pool engaged in cutting edge research on different areas like science & technology, industrial development, design etc. Over the past years, favourable factors for undertaking research in Karnataka have included relatively better geographical clustering and institutional networks in comparison to other States¹⁸. As a result Karnataka hosts a large number of publicly funded as well as corporate R&D institutions together with a strong base of academia and engineering institutes. More than 100 Corporate R&D Centres have been set up by various Industrial players in Karnataka¹⁹ and some of the key ones set up in Bangalore Urban (Figure below).

Figure 4: Major Corporate R&D Organizations in Bangalore



¹⁷ A compiled list of such Institutions is attached in Annexure II and III.

¹⁸ IBEF Report, 2008-09

¹⁹ A list of major Corporate R&D Centres for select Industries is listed in Annexure

- **Bangalore Urban** is in a pioneering position for corporate research initiatives in Karnataka
- **Mysore, Dakshina Kannada, Gulbarga, Shimoga & Dharwad** are developing as Key Industrial Centres and also have a relatively strong base of Higher Educational Infrastructure in place. These districts have the potential of developing as Research & Innovation destinations of the State.
- **R&D activities in Karnataka has an increasing trend and will be one of the key driving factor in the State’s transformation into a vibrant Knowledge Society**

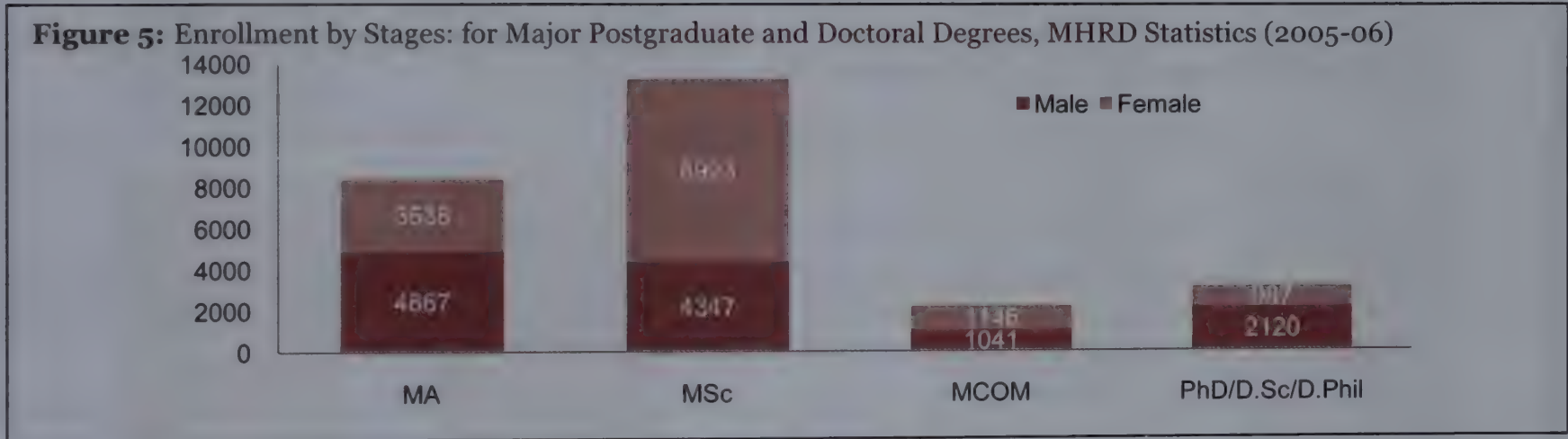
Sources: Drawn from analysis of Economic Survey of Karnataka 2008-09, IBEF Reports and PwC Consultations.

Researchers in Karnataka

Research driven innovations in Karnataka heavily rely on the quantity and quality of Researchers produced in the State

For sustaining research activities, there has to be flow of researchers in adequate numbers and that there is a linkage between the demand and supply of researchers at state level. A potential increase in the quantity and quality of PhDs leading to a larger pool of researchers produced in the State would not only help to foster the research activities and knowledge creation but will also ensure a greater local state capacity to meet its rising research needs. From a long term point of view, it will help to sustain the demographic advantage of Karnataka in respect to the R&D workforce, leading to greater employment generation for the population.

Researchers usually consist of a diverse pool including graduates, post graduates and PhDs. In order to capture the research manpower that is leading to new Knowledge Creation, an assessment of the latter two categories are more important, especially the PhDs. Therefore, we look at the pre and post doctoral statistics of higher education to understand the local state level supply side of R&D workforce which is vital for catering to rising needs in research.



Transition Rate for Doctoral Studies: The Figure above depicts the number of M.A., M.Sc., M.Com and PhD enrollments in Karnataka in 2005 – 06²⁰. It indicates that the number of doctoral enrollments is less than 15% of the postgraduate enrollments.

Women Researchers: Moreover there is a shift in the gender composition between the postgraduate and PhD courses. Even though more women than men enrolled for pursuing post graduation there are twice as many men than women in PhD Enrollments. A recent study on Gross Enrolment Ratios in Higher Education in Karnataka undertaken by the Karnataka Knowledge Commission shows that out of about 3159 PhD enrolments in the State, 2264 enrolments (72%) are male candidates whereas the remaining 895 enrolments (28%) are female candidates. This shows that there is scope for potential increase in the PhDs by targeting an increase in the transition rate from post graduate to doctoral programs, with special focus on women. For instance, Karnataka has a State level Women’s University in Bijapur where 613 students were enrolled in PG

²⁰ MHRD Selected Educational Statistics for the years after 2005-06 do not contain information on PhD students

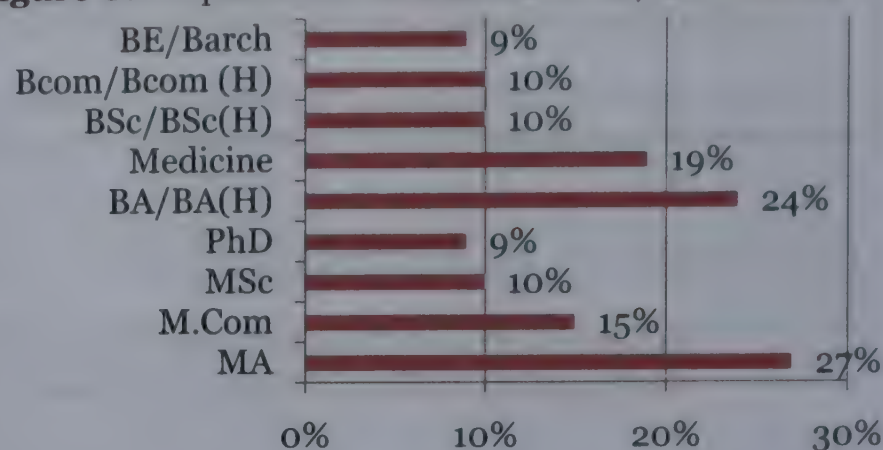
courses and 50 more for PG Diplomas in 2008-09 but the University had only 60 students registered for PhD degrees²¹.

SC/ST Enrolments: The adjacent Figure shows that SC/STs are lagging behind in the area of research as their enrolments in courses like PhD and BE/BArch is only 9% compared to other areas of study where they are much greater proportions including Arts (BA,MA), Medicine and Commerce.

Quality standards for Doctoral Education:

In terms of setting standards for educational institutes, National Assessment and Accreditation Council (NAAC) a national agency assesses and accredits institutions of the state. Recently, the Technical Quality Improvement Programme (TEQIP) has also been introduced by All India Council for Technical Education (AICTE) but like NAAC this is also not mandatory and interested institutions can apply for it and if selected are assisted with best technologies for quality improvements in R&D. Out of the 20,000 colleges in the State only 4,000 volunteered to obtain the accreditation in 2009²².

Figure 6: Proportion of enrolments of SC/ ST students



Source: Selected Educational Statistics (2004 -05)

Interviews with service providers and researchers undertaken as a part of this study have brought out certain issues in quality and infrastructure of Higher Education and Research in Karnataka.

Findings from Primary Survey on quality of research

- Only 49% service providers felt that Karnataka has high quality researchers in their respective fields and 15% of service providers strongly disagreed with this opinion.
- Interviews with researchers indicated a sense of inadequacy of government support for research and related activities.
- 59% researchers felt that the State does not provide sufficient funding for research.
- 55% of all the respondents stated that the number of faculty in universities and colleges is insufficient. This is also highlighted in Karnataka Vision 2020 paper which says that one of critical issues affecting the quality of higher education is the scarcity of qualified and experienced teachers.
- Only 41% of all respondents felt that Karnataka has distinguished and well-renowned faculty to support research activities.

Primary survey indicates that quality of higher education and research facilities is a matter of concern in the State and needs to be addressed appropriately. Most studies and policies give emphasis on creating physical infrastructure for fostering research but it is also equally important to ensure that the existing institutions of higher learning are generating quality outcomes. The National Knowledge Commission recommendation on producing more quality PhDs holds relevant in this context. NKC Report to the Nation says: *'the declining quality of research work and deteriorating research standard and Infrastructure in India is a cause of concern. Inadequate infrastructure and lack of strong incentives to practice quality research are major causes of decline in interest towards research work.'* This national issue can be traced to Karnataka as well.

²¹ Annual Report (2008-09) of Karnataka State Women's University, Bijapur

²² Deccan Herald, August 19, 2009

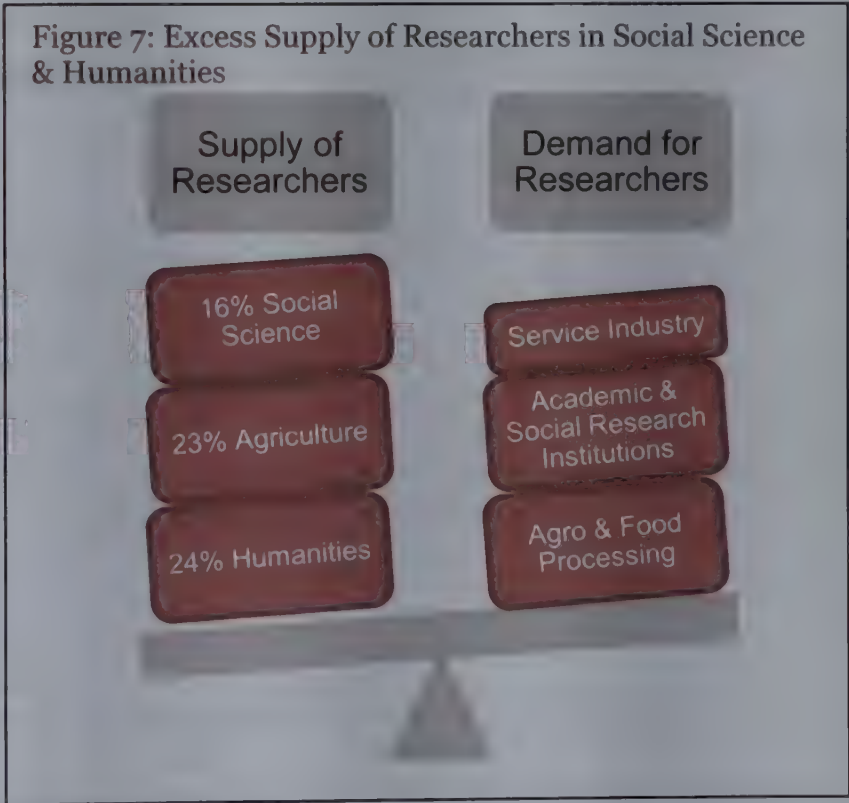
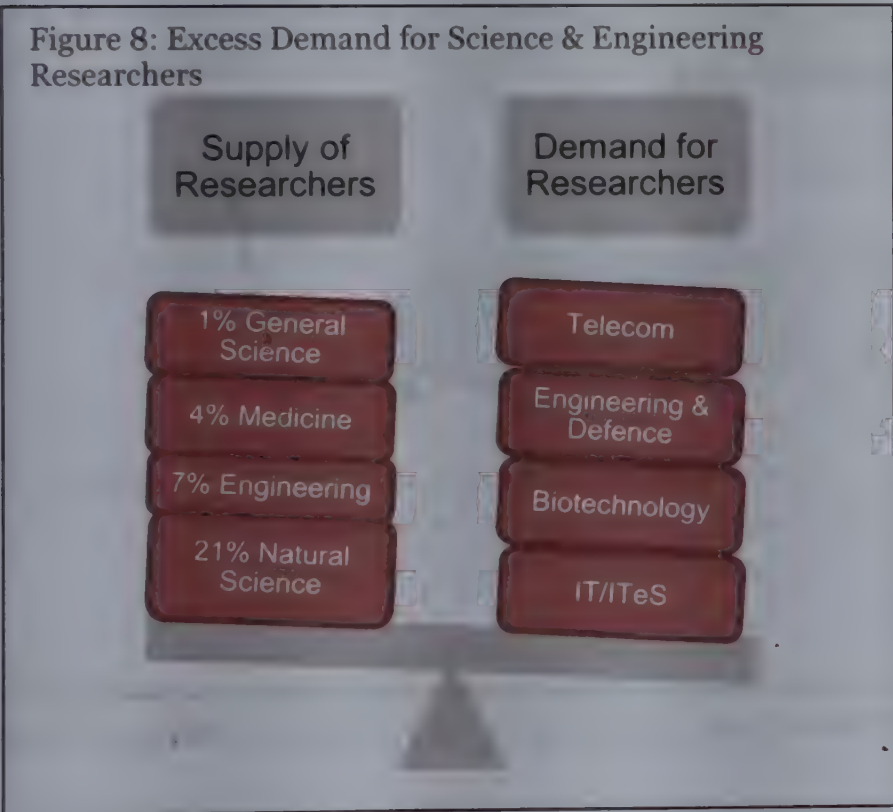
Role of digital media for quality enhancement: Quality Researchers are needed for propelling the transition of Karnataka towards the Knowledge Society. Digital media and ICTs in Research is a key input factor that can enhance quality and connect state level researchers to global discourses. 55% of researchers felt that research institutions in the State do not have good access to digital media and 59% felt that there was a lack of good access to libraries. Access to laboratories was also highlighted as a key concern with 36% of the view that institutions lack access to good research facilities

Market Demand and Supply mismatch for Researchers: A linkage needs to be established between the Industry demands and the areas where the doctoral research is being channelized in Karnataka. The reasons why an understanding of the areas of research study is vitally important are:

- To ensure that research is being channelized as per the capacity needs of the industries in the state
- To have an application focus - such that the research is used for spreading knowledge in the society
- To ensure that future needs and sustainability are taken into account in the knowledge framework through robust research and other preparatory mechanisms.

Market demand: for researchers is largely focussed in the high growth sectors like IT/ITeS, Engineering, Biotechnology, Telecom, Defence etc. where the applications of research is produced. Multinationals in these sectors have already opened or are in the process of starting in house R&D centres in Karnataka which would need adequate support of personnel and skilled workforce.

Supply of Researchers: on the other hand is analysed by a study on PhDs undertaken by NIAS²³ which shows that of the considered sample, maximum number of PhDs were awarded in the subject vicinities of Humanities (24%), Agriculture(23%), Social Sciences(16%) whereas Engineering (7%), Commerce (4%), Medicine (4%) and General Sciences (1%) were pursued by comparatively lesser numbers.



There is a mismatch in demand and supply of researchers in the State. This leads to immigration and emigration of high skilled labour in the State, which helps to bring in the balance in the market dynamics. Nevertheless, Karnataka has a huge demographic advantage and if the government acts as a facilitator to cater to greater market demand (Figure 8) or create employment opportunities (Figure 7) as required it would lead to dual dividends for the State.

²³ Trends In Higher Education - Creation And Analysis Of A Database Of PhDs, Anitha Kurup and Jagdish Arora, National Institute Of Advanced Studies, 2010

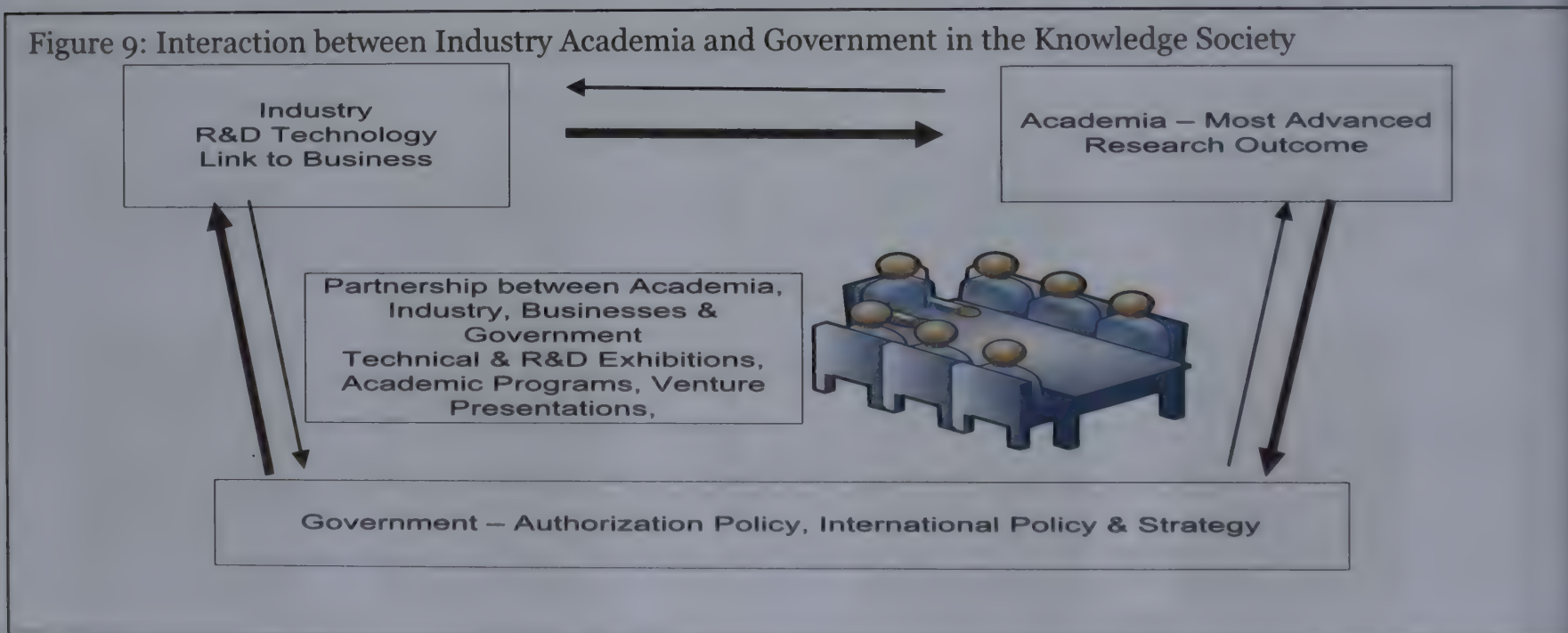
The popular areas of research as identified by the researchers in the Primary Survey are listed in the Table below. Some of them like Biotechnology, Food Processing etc have already expanded largely but for others like Stem Cell Research, Genomics, ICTs in medicine, etc. the potential has not been full optimised.

Table 3: Popular and Upcoming fields of Research in Karnataka as revealed by Researchers in Primary Survey

Popular research fields in Karnataka		
Biotechnology	Stem cell research	Food processing
Nutrition	Local economic governance	Genomics
Ageing	Chemical research	Renewable energy
IT in healthcare	Micro-electronic mechanical systems	Technical management of cities
Public participation in governance	Animal sciences	HIV-AIDS
Clinical trials	Operations research	ICT in medicine
Bio-medicine	Organic chemistry	Bio-chemistry
Cognitive learning ability	Learning methodologies	Models of Teaching
Communicable diseases	Therapeutic foods	Yoga therapy
Sericulture	Local Health Traditions	Mental health and Injury Prevention

Collaborations & Knowledge Networks

Collaborations between stakeholders involved in research, is a must for enhancing Knowledge Creation activities in Karnataka and for propelling its transformation into the Knowledge Society.



Most studies focus on collaborations between the industry and academia to bridge the demand and supply gap. In addition the government plays the role of a facilitator, providing the policy thrust for the Industries and filling in the market inefficiencies where required. Collaborative interactions between these three stakeholders are vital on an ongoing basis to ensure that factor advantages of the State are optimally utilised and will be a key component of the Knowledge Society. At present, Karnataka has its share of seminars, industry meets, collaborative forums etc. Their

Primary survey results on research collaborations

About half of the researchers surveyed feel that there is insufficient inter-disciplinary research being conducted in the State.

41% stated that there is inadequate collaboration between state research institutes and their national/ international counterparts.

At present, Researchers responded that student exchanges were the primary form of collaboration between institutions (55%). Only 32% feel joint projects are major forms of institute collaboration also.

targets, geographical locations, frequency and statistics need to be looked at, to ensure that the changing market needs are addressed and facilitated to bridge the skewed demand and supply in the areas of research. **Analysis of the responses received from service providers in the primary survey shows that about 64% felt that there are formal mechanisms for interactions between service providers and research institutions and policy planners. However, further discussions revealed that these were of limited depth and frequency.**

Human Development centric R&D: Corporate players are making their approach more holistic by responding to societal needs across industry verticals. This is done by bringing about new social infrastructures, innovations, solutions, and services through community interactions and reaching out to the grassroots. In Karnataka, most research is fundamental or applied in nature with low awareness on encompassing social requirements. The Knowledge Society would comprise a networked society with a human face. This culture needs to be gradually inculcated into the vibrant corporate environment of Karnataka.

Primary survey results on role of Government as a facilitator in Knowledge Creation:

(Some areas pointed out by researchers in the Primary Survey, where in Government facilitation can support research activities in Karnataka)

- Facilitating industry-institute interactions by providing interfaces
- Promoting and facilitating more collaborations between institutes
- Establishing and encouraging linkages with national and global research bodies
- Creating State Commissions for education and medical research
- Creating independent peer reviewed competitive forum for research funding
- Earmarking research funding for priority areas
- Providing more fellowships and grants for students to pursue research
- Promoting research at school level
- Establishing research parks by inviting research and development firms from around the world by offering suitable incentives
- Promoting knowledge dissemination meetings of researchers
- Upgrading the laboratory facilities
- Establishing a Research and Innovation fund
- Set up mechanisms for knowledge translation and exchange

Output Parameters of Knowledge Creation

Patent trends in Karnataka

In the present scenario, Patents are not only being used as a tool to protect creativity and generate revenue but also to build strategic alliances for socio economic and technological growth.

Table 4: Leading Innovators in Karnataka (in terms of patent applications made)

Sectors	Top Patent Applicants in Karnataka
Pharmaceutical Industry	Avesthagen Ltd
IT/ITeS	Samsung India Software Operations, Infosys and Tata Elxsi
Scientific R&D Organisation	ISRO
Institutes & Universities	Indian Institute in Science (IISc)

Source: drawn from Annual Reports of Indian Patent Office

Karnataka has emerged as a hub for collaborative and outsourced R&D. Contract research on areas like drug development, biotechnology and chemicals and particularly clinical research is a dynamic industry in the State leading to huge local employment opportunities for researchers and skilled professionals in the State. The key innovators based in Karnataka which are high performers and have registered highest patent applications include Avesthagen Ltd., Samsung, ISRO and IISc.²⁴ (Table 4).

Patent activities in Karnataka:

- Patent Applications are reflective of quantum of R&D activities undertaken in any economy.
- **Karnataka a regional hub for R&D:** with second highest patent applications (872) following Maharashtra (1990)
- **Increasing Trend of Patent applications in Karnataka:** Karnataka patenting activities has followed the national trend and total number of patents filed have increased from 216 to 872 between 2004 – 2009

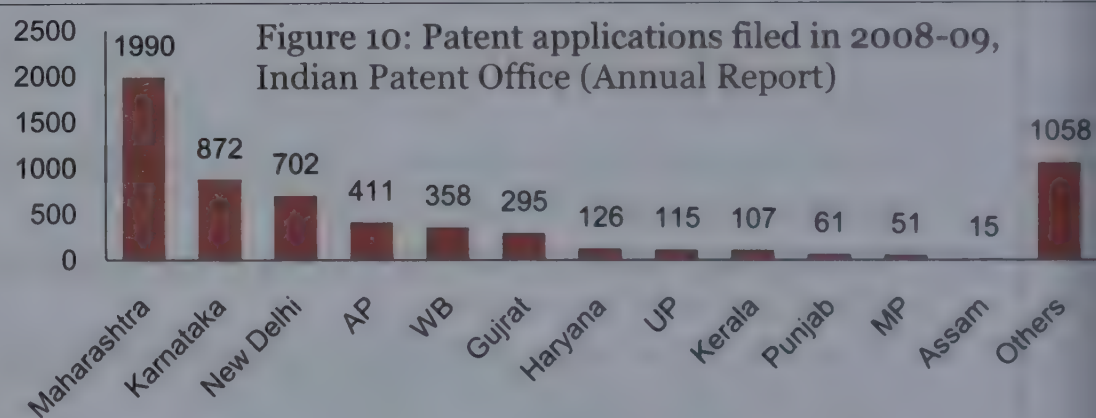
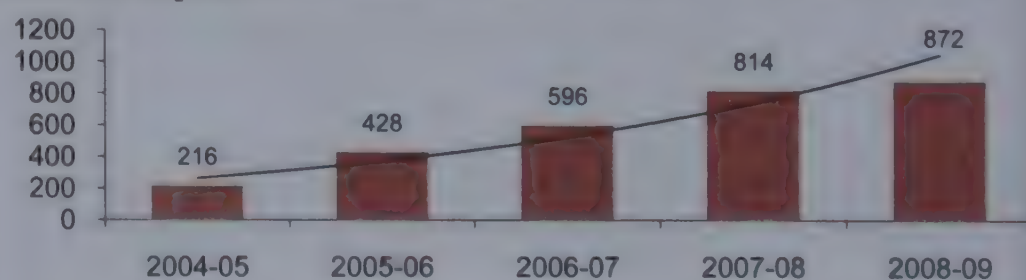


Figure 11: Patents filed in Karnataka (2004 – 2009); IPO (Annual Report)



Private Participation in Research

Private players play a key role in encouraging, funding and generating market linkages of research in Karnataka. Primary survey involved interviewing the researchers on the possible mechanisms that can be used to strengthen private ties with research in the State and the results are listed below.

²⁴ It is to be noted that patents filed has been considered as a proxy for patents registered, due to lack of data availability on the latter.

Perception of Researchers in Primary Survey

Views on the ways in which Private Participation in Research can be strengthened

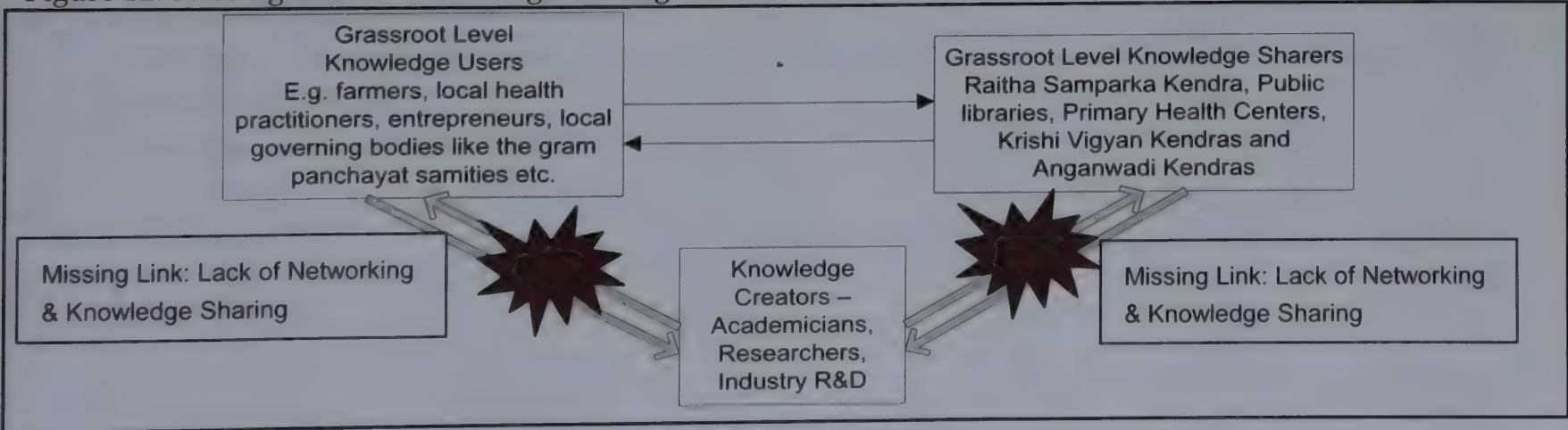
- Facilitation of private sector contributions to research funds
- Institution of chairs and fellowships sponsored by the private sector
- Establishment of research parks
- Encouragement of private sector to provide support in setting up incubation centers, centers for excellence etc and to be a part of platforms/ commissions to decide on priority areas of research
- Provision of greater autonomy to private institutions with respect to setting up of research curriculum and recruitment of researchers.
- Provision of concessions to the private sector for involvement in research
- Facilitation of linkages between industry and institutions
- Memorandums of Understanding with industries to share facilities
- Giving tax exemptions, concessions, incentives in the form of land and soft loans etc to the private sector if they undertake research

Research Papers in Karnataka

Over the years, State specific research has been undertaken in the areas of Earth Sciences, Aquatic Biology and Fisheries (Zoology), tissue-culture techniques for rare plants (Microbiology and Botany), Petrology and Geochemistry (Geology), Highway road research (Civil Engineering), mulberry research (Sericulture), collection of rare Kannada manuscripts and cultural folklore artefacts and translation of significant works of literature from Indian languages into Kannada (Kannada), Oral History, Legal and Social aspects etc.²⁵ These have been published (print and electronic) in National and International Journals and also in some local and institutional level publications (e.g. Journal of Karnataka Studies published by Kannada University (Hampi), Prasaraṅga –Karnatak University (Dharwad) Press, Karnataka Journal of Agricultural Sciences, Karnataka Law Journal Publications etc) and offer valuable sources of information on the state.

However, the key research on Karnataka State specific areas forms a very small proportion of overall research activities and the outputs produced are not consolidated under a common formal platform. As a result, the end users of the research including relevant public groups, local government agencies, policy makers, industry players etc do not have a convenient access to it, leading to dissemination bottlenecks. Moreover for the grass root level users, the main sources of information sharing include: Raitha Samparka Kendra, Public libraries, Primary Health Centers, Krishi Vigyan Kendras and Anganwadi Kendras etc. There is a missing link between the Users, Knowledge Sharers and Researchers or Knowledge Creators. Hence a mapping needs to be established to link the gaps, as illustrated below:

Figure 12: Missing links in Knowledge sharing with the Grass root level Users



²⁵ Bangalore University Website

The survey also finds that almost 70% of the beneficiaries felt that there was not sufficient interaction between citizens and members of academia, research community and policy makers. While some agreed that access to these groups did exist, it was the lack of formal channels or forums that hindered such interactions. The following comments were recorded during FGDs with service providers in the education, rural and urban development sectors:

- *'Presently, with whatever limited number of interactions happening, policy planners are only meeting few higher level authorities who don't even have a feel about the grass root level or school level.'*
- *'Local level interaction is nil. People who are actually engaged in welfare works are not given permission to interact with department people involved in public works. There is some unknown person, who is not familiar with the area that is made responsible for the work.'*
- *'Make an open forum for all the level service providers and even beneficiaries through mobile and newspapers. If people don't participate in it, then they are the losers.'*
- *'I had interacted with [a large private sector IT organization] once for some program. They had developed software to educate neo literates and illiterates. But in that, they had left out few basic things like, how to write a letter in Kannada. This was only because of lack of interaction with grassroots and field level people.'*

In conclusion, Karnataka has a wide range of resources for knowledge creation including people, funds and institutions. The State is an emerging national destination for R&D with Bangalore as one of the leading destinations in Innovation in the country. The new knowledge created and lessons learnt need to be dissipated to the grassroots and there is a need for collaborations between industries, academia and government to promote research to meet global demand and also address local needs.

Knowledge Creation: A Synopsis

Strengths:

- Bangalore has emerged as the 'Research & Innovation' hub with a number of premier institutions undertaking research.
- Districts like Mysore, Dakshina Kannada, Gulbarga, Shimoga & Dharwad have a strong base of Higher Educational Institutions and Industrial centres.
- The State stands at second position nationally with respect to Patent Applications made. These applications are made in a variety of research areas including IT, Biotechnology, Pharmaceuticals, Social Sciences etc.

Weaknesses:

- Districts other than Bangalore Urban lack in applied research.
- Science and Technology streams have Excess Demand for researchers whereas Humanities and Social Studies have Excess Supply.
- Lower transition of women after post graduation leading to lesser number of women researchers in the State
- Lack of strong incentives to practice quality research leading to a decline in interest towards academic research
- Insufficient inter-disciplinary research due to lack of collaborations between stakeholders engaged in R&D.
- Karnataka specific research forms a very small proportion of overall research activities and the outputs produced are not consolidated under a common formal platform.

Key Gap Areas:

- **Education & Research:**
 - Lack of centralised resource profiling, disparities in quality of Higher Education and equal opportunities for all
 - Lack of market oriented skill Development and inter- linkages between demand and supply of resources
 - Lack of collaborations between industry and academia
- **Health and Bio-technology:**
 - Over reliance on outsourced research and lack of original research in bio-technology and medicines
 - Lesser focus on local Health traditions and alternative health practices
- **Agriculture:**
 - Inadequate coverage and lack of application of research to improve agriculture practices
- **Rural Development:**
 - Little research on specific livelihood issues facing the state in rural areas and means to address them
- **Urban Development:**
 - Research on accelerating urbanisation and ways to reduce disparities in infrastructure

Knowledge Dissemination in Karnataka

Dissemination, communication and sharing of new and existing knowledge through robust systems and processes is critical for the desired transformation into a Knowledge Society

Overview: Dissemination of knowledge is the critical link between creation and application of knowledge which when effectively undertaken guarantees universal access of knowledge to all. Dissemination activities largely constitute sharing and distribution of knowledge to the masses. Knowledge created through various research and development activities and industrial spill over is channelized to the society and its users. Dissemination Channels (Systems & Processes) can either be formal e.g. knowledge transfers in schools and educational institutions or can constitute informal mechanisms of mass communication e.g. knowledge transfers through various digital media. In addition, dissemination can also take place through verbal communication e.g. indigenous knowledge is transferred through oral traditions which enable knowledge sharing between generations. These channels are spread across all the key sectors of the society, including education, health, agriculture, rural development, urban development and the robustness of such mechanisms ensures social, economic and political awareness leading to overall human development.

Core areas covered in the present study: The present section will delve deeper into the resource profiling and mapping of Knowledge Dissemination. The key areas looked into include:

- Institutional mediums of knowledge dissemination including Schools, Colleges, Training & Development Institutes, etc.
- Knowledge repositories and experience-share methods including traditional methods of knowledge transfer as in Health, Agriculture, non-farm sectors etc.
- Mass communication methods and Information & Communication Technologies (ICT)

Education and Skill Development

Efficient education and training systems are essentials for effective and systematic dissemination of knowledge. Engagements with them at various levels enable these systems to shape people's thoughts and their economic social and living conditions. Educational systems constitute of the schooling, baccalaureate and post baccalaureate systems, where as the training systems constitute those focussing on skill development and vocational education. This section tries to encapsulate the current status of these systems in Karnataka in order to develop an understanding of the existing gaps and requirements.

School Education

This sub section outlines the current status of primary and secondary education and the highlights the requirements to be fulfilled for transitioning towards the Knowledge Society.

State Government's Goal for Elementary Education: It is very important to have a sound and effective educational system in place for transforming the State into a vibrant Knowledge Society. The State is striving towards achieving the goal of Universal Elementary Education (UEE) which includes the attainment of:

- Universal Access to primary schools for all children
- Universal Enrolment
- Universal Retentions
- Universal achievement of minimum essential levels of learning by all children

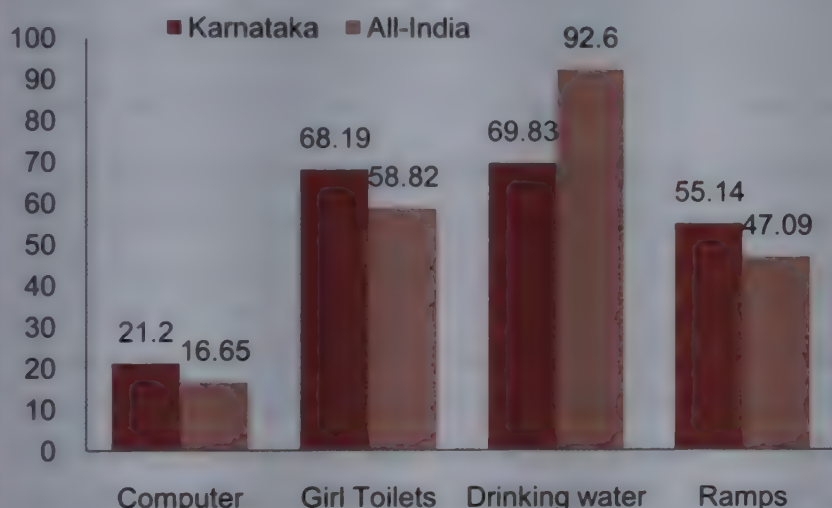
This encompasses the **Millennium Development Goals (MDG) for Education** to be achieved by 2015. Achievement of these goals is largely dependent on status of educational systems in Karnataka and their efficacy in facilitating dissemination of knowledge.

Status of Elementary Education: Karnataka has around 60,000 elementary schools with around 3 Lakh teachers and 8.4 million students (March 2010)²⁶. Post enactments of the Right to Education (RTE) Act (2009), all states are mandated to provide free and compulsory education to all children between the ages of 6 – 14 years. The Act prescribes norms on school accessibility, infrastructure, teaching and learning etc. and meeting them would surely help the State to achieve its targets for the education sector. The present resources in this respect in the State and key requirements are highlighted below.

Access: Currently, Karnataka has on an average 2.99 primary schools and 1.66 upper schools per 10 sq km²⁷. The basic norm for RTE mandates presence of at least 10 primary schools and 3 upper primary schools within this radius, showing that the State has a long way to go to meet the above norm. In specific, the district of Bidar is most lagging in terms of access.

In addition, infrastructural facilities such as ramps, drinking water and separate girl toilets that influence the attendance of children in school are sparingly available in the schools – the infrastructure levels are closer to the national averages (Figure below). ***In the Primary survey as well, 83% respondents recognized the need to strengthen physical infrastructure facilities at government run institutions to ensure better quality education.***

Figure 13: Basic Infrastructure in schools (%), DISE (2009-10)



Computers in Schools

- There is strong support for exposure to computers with 84% of beneficiary respondents expressing the view that introduction of computer education at schools is beneficial for the students.
- At present, only 21% of schools in Karnataka have a computer
- Availability of computers is the first step towards revamping the education system
- The next step would be to ensure the functionality of computer aided learning in schools possibly through robust reporting and management systems in place.

Enrolment: Gross Enrolment Ratio (GER) is commonly used to show the extent of participation at various levels of education. For Karnataka, the GER for ages 6- 13 is 99.98²⁸. Such high number is due to presence of over-age students in the age-group. There is around 1 Lakh out of school children in Karnataka. Though, this is only 1.27% of the total schooling age population and much better than the national average of 4.28%²⁹, there is a need to bring these children to school and achieve universal education. Schemes like

‘The dramatic growth in Indian elementary education, enrolment and improvements in retention and transition rates over the past ten years, particularly among more disadvantaged groups, are increasing pressure on the secondary level to absorb new entrants.’

-World Bank Report on Secondary Education (2009)

²⁶ www.ssakarnataka.gov.in

²⁷ DISE Statistics, SSA (2009-10)

²⁸ DISE Statistics, SSA (2009-10)

²⁹ All India Survey of Out of School Children, MHRD, 2009

Samudayadatta Sale Programme have brought back more than 2 Lakh children to schools³⁰ and provision of bicycles to girl students has encouraged participation.

Status of Secondary Education: Karnataka has 12,451 secondary schools with 1.63 million students (March 2010). With the growing emphasis on elementary education the focus on retaining students at secondary levels and providing them with quality education is increasing. At present, only around 60% of students in elementary schools move on to pursue secondary level education in the State. Delving deeper into the existing educational outcomes, it is seen from adjacent Table that only about 67% of the students enrolled could pass the secondary school examinations. Only 57 per cent of the SC and 58 per cent of the ST students could pass the examinations much lesser than the general category students. Moreover the differentials between girls and boys also persist with an average girl child performing much better than the boys.

Table 5: % of Students passing Secondary School Examination

Category	Boys	Girls	Total
Schedule Caste	55.14	58.98	56.93
Schedule Tribe	55.52	60.36	57.76
Category-1	60.38	66.69	63.28
Others	66.79	73.7	70.14
Total	63.72	70.15	66.81

Karnataka Secondary Education Examination Board, 2010

The **Rashtriya Madhyamik Shiksha Abhiyan** is aimed at universalizing access to and improving the quality of secondary education. In Karnataka, presently, the secondary schools set up under the RMSA are functional within existing accommodation available in the location. Suitable sites where permanent infrastructure for the school buildings can be set up are being identified. The schools have become functional with commencement of ninth standard in 80 schools from the academic year 2010-11 and 249 schools in 2011-12. The medium of instruction followed are Kannada, Urdu, Marathi and Tamil. The Karnataka State syllabus is followed and the examinations are conducted by the Karnataka Secondary Education Examination Board (KSEEB).

Quality in School Education: An additional Karnataka School Quality Assessment Organisation (KSQAO) was set up in the State as the first of its kind in the country to look into learning assessments of students for identification of quality concerns. However ASER (2010) points out that there are major quality concerns in elementary education in Karnataka with Class IV students not being able to meet the standards expected out of Class II students. This supports the KSQAO survey findings (2006) on low quality in education with only 49 % and 48 % of class V and VII students exhibiting the required competence levels. The aspect of quality becomes increasingly important as the number of primary enrolments is increasing under the RTE. **Moreover with respect to the desired transition towards the Knowledge Society it would be important to achieve basic quality at all levels of education to escalate the learning levels of the society.**

Curriculum: In addition to teaching learning outcomes for quality education, the curriculum plays a key role in the knowledge content and effectiveness of its dissemination. The expressed vision for school education includes the *process* of delivering education as a key component in the quality of education. The National Curriculum Framework (NCF) 2005 expresses concern with the present method of treating examination results as the sole criterion for judging quality. Instead, it recommends a shift from the existing system where the child is perceived as a receiver of information to one where he/ she can be a part in constructing knowledge. Stakeholder Focus Group Discussions (FGDs), in our primary survey brought out the need to update syllabus in line with recent developments.

For quality enhancement in the entire education spectrum, it is highly imperative that improvement in student education and teacher education go hand-in-hand. In the light of this requirement, The National Curriculum for Teacher Education (NCTE) undertook a major exercise of developing a new **National Curriculum Framework for Teacher Education** which is in tune with the emerging national and

³⁰ Karnataka Education Department website, 2007

international concerns and requirements. Apart from ensuring high academic and professional standards of the teachers, reforms in teacher curriculum must also enhance the competence, sensitivity and motivation of teachers. The length of academic preparation, the level and quality of subject matter knowledge, various pedagogical skills possessed by the teachers to meet the needs of diverse learning situations, the degree of commitment to the profession and the sensitivity to contemporary issues and problems critically influence the quality of curriculum transaction in classrooms and thereby pupil learning and the larger social transformation.

Sectoral aspects that can be developed in the school curriculums

Views of respondents in the Primary Survey

- **Health:**
 - An overwhelming majority of 98% of respondents stated that focus on aspects of **Health & Nutrition** at the school level is a must.
 - About 25% respondents felt that more attention needs to be put on educating school children on these aspects of health, nutrition and hygiene to inculcate good lifestyle habits at a young age.
- **Urban Development:**
 - During the FGD with urban development sector beneficiaries it was suggested to have a separate subject to create **Civic Awareness and Basic Rights** in addition to the present modules on the Indian Constitution taught in the State
- **Agriculture & Rural Development:**
 - About 35% rural respondents ‘strongly agreed’ and 51% ‘agreed’ that basic school education can impact agricultural productivity. **80% of the respondents felt that basic education is an absolute necessity to maintain and increase productivity levels for the next generation.**
 - About 84% respondents said that it was important for rural schools to provide **Agriculture related knowledge to students (including traditional practices and introduction to new methods, examples from around the country and abroad).**

Teachers in School Education: 87% beneficiaries in our primary survey, perceived teachers at local government schools to be competent and well trained. Karnataka DISE data also shows that the distribution of professionally trained regular teachers is as high as 96% and that of contractual teachers is around 91%.

However, the key concern revealed in primary survey was that mostly the number of faculty members is inadequate for the number of students, faculty members are also overburdened with duties not related to teaching. In this respect, analysis of Karnataka DISE data shows that 7.44% of the primary schools in the state continue to be single teacher schools. Although the average Pupil-Teacher ratio (PTR) of the State is 27, around 16 districts have a PTR >30. Moreover 3.03% of elementary schools in the state have a PTR>60, with PTR touching 80 for high schools. The following comments recorded during FGD with education sector beneficiaries further validate this point:

- *“In government school the responsibility of the teachers is too much, they give them survey duty, election duty, etc., because of this children face the problem ... that is the reason children are not able to give respect to the teachers... and teachers are not able to concentrate and teach properly”*
- *“Even though the teachers are appointed on merit basis, once they start working, they lose interest level and start giving poor quality of education to students. All this is because of poor monitoring system of teachers. Nobody is there to monitor teachers.”*

In conclusion, the budgetary allocations and existing initiatives seek to enhance access, infrastructure and quality in school education of Karnataka. However, there is scope for updating contents; curriculum and methods of teaching to improve the GERs at secondary and high school level. The demand for better resources and facilities has increased at secondary level over the years with RTE and greater access to elementary education. Although the Rashtriya Madhyamik Shiksha Abhayan (RMSA) aims to achieve this by providing

for secondary schools within reasonable distance of every habitat, strengthening of secondary schooling is vital for ensuring that the rising influx of students into mainstream education are adequately trained.

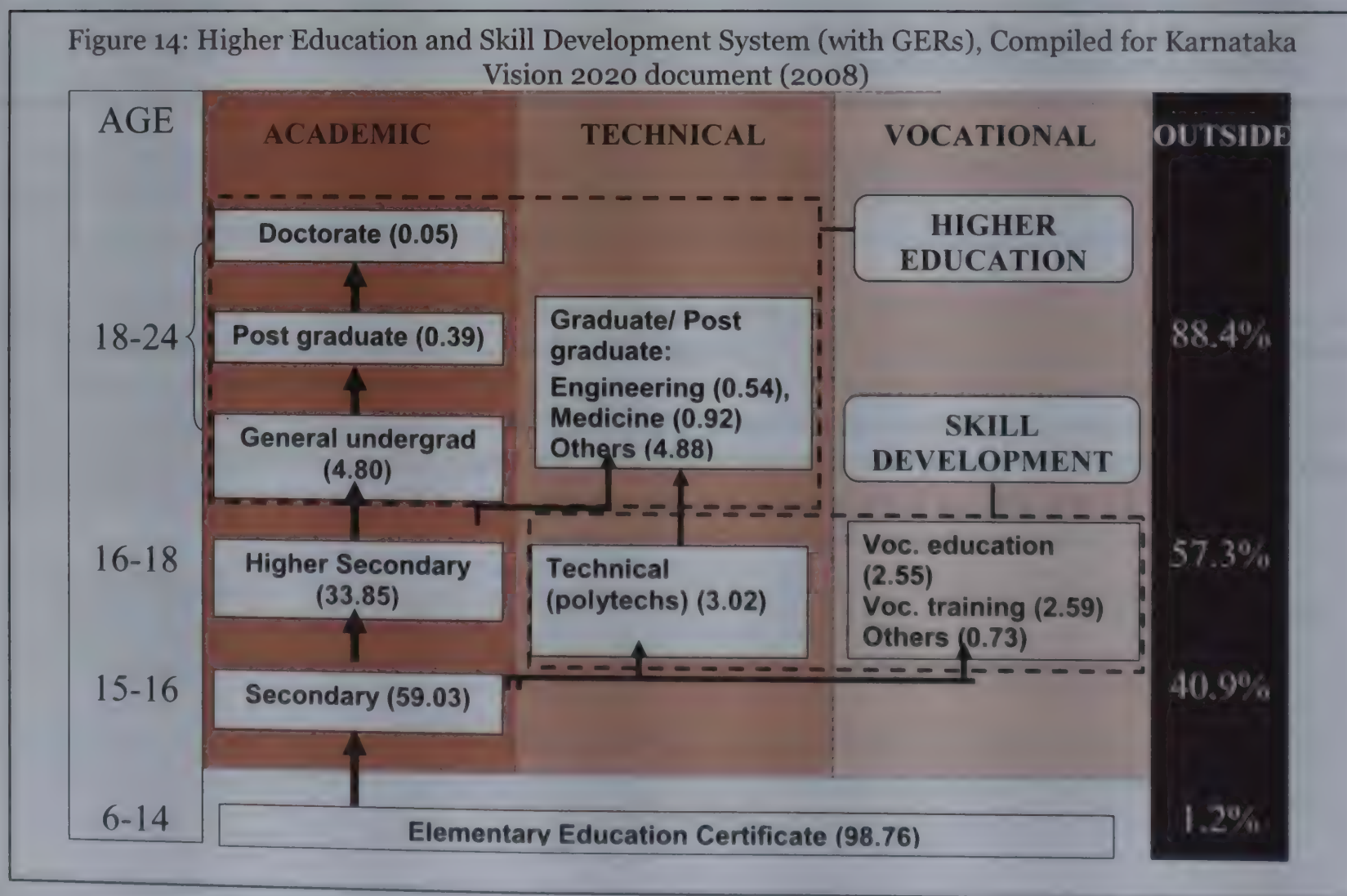
Higher Education

The objective of the Government of Karnataka is to ensure that 'higher education is equally accessible to all on basis of merit'. The following sub section details the current status of Higher Education institutions, systems and outcomes in Karnataka and identifies the areas of development to enable attainment of this objective.

Higher Educational Infrastructure: Higher education includes undergraduate education, post graduate education as well as research institutions. The latter is covered earlier and this section focuses on the former two categories. 'At present, there are 481 degree colleges affiliated with one of the universities in the state namely Bangalore University, Gulbarga University, Karnataka University, Kuvempu University, Mangalore University and University of Mysore. In 1998, the engineering colleges in the state were brought under the newly formed Visvesvaraya Technological University headquartered at Belgaum, whereas the medical colleges are run under the jurisdiction of the Rajiv Gandhi University of Health Sciences'³¹. Some of these baccalaureate colleges are accredited with the status of a deemed university. Udupi, Sringeri, Gokarna and Melkote are well-known places of Sanskrit and Vedic learning. There is also a Bijapur Women's university as well as a Kannada University in the State, apart from around three Agricultural Universities. A Veterinary University was also set up in the State during 2009-10³². In addition to government and aided colleges, there are a large number of unaided/private colleges in the State which cater to higher educational requirements.

Transition rates in Higher Education:

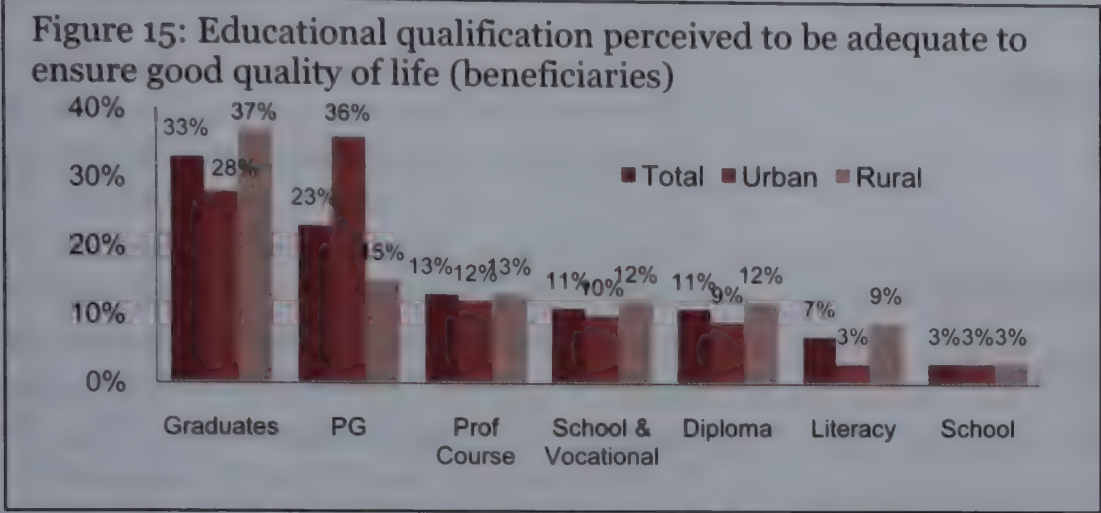
Figure 14: Higher Education and Skill Development System (with GERs), Compiled for Karnataka Vision 2020 document (2008)



³¹ Official website of Government of Karnataka (<http://www.karunadu.gov.in/education/Pages/colleges.aspx>), retrieved on 5.08.2011

³² www.ssakarnataka.gov.in

It is clear from the figure above that the GER in the formal education stream drops considerably from elementary to secondary to higher education. The column ‘outside’ indicates the proportion of persons in the age-group who have not enrolled into any education or skill development courses. The youth dropped out of formal educational institutions often receive the required skills to work, through vocational training institutions in the State. However, a large number of youth (57.3% of those who pass higher secondary schooling) do not receive any further education or skill development/training the demographic advantage seems more like a challenge to ensure training and employability of the State’s young population.



The educational preferences of rural and urban beneficiaries for enabling a quality life were recorded during primary survey. Analysis reveals that Graduate level education is considered to be the most preferred level for rural beneficiaries whereas the option for Post graduate degree is considered more important by the urban ones. Also, though only 3% respondents perceived basic school education sufficient to ensure a good

quality life, that percentage jumped to 11% when school education was coupled with vocational training. The response was higher in rural areas showing that vocational education is a driver for better employability and livelihoods especially in rural Karnataka.

General Colleges: Colleges in Karnataka are either government, aided or unaided (private). The Department of Collegiate Education is in charge of the first two and undertakes various initiatives for their development. The private colleges are established in areas with larger consumer demand for higher education whereas the govt. /aided colleges are more focussed on equitable access. We focus on these two categories in this study.

District wise Mapping of Colleges: Mapping the district wise distribution of general colleges in Karnataka, a vast disparity across the state is observed. The key observations are listed below.

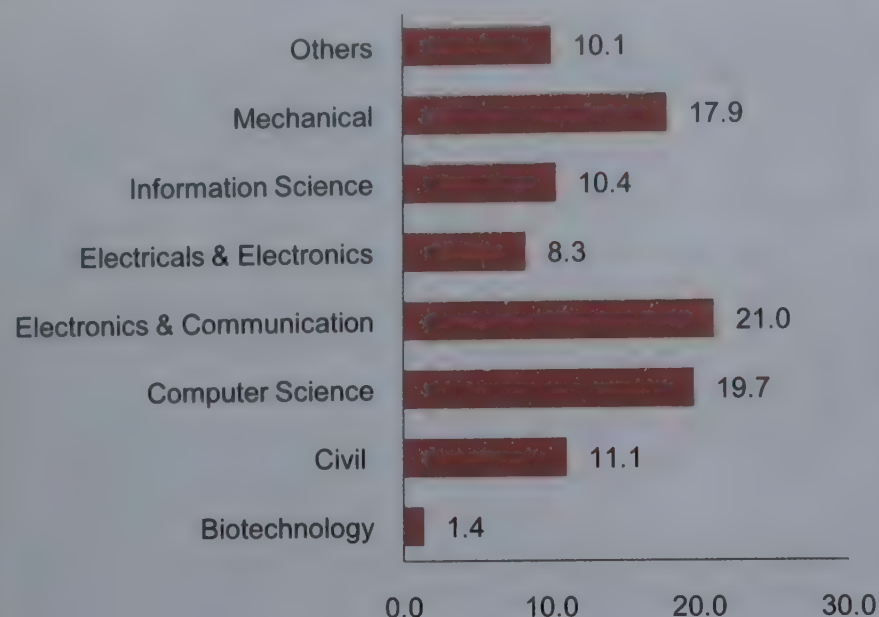
- Majority of the institutions of higher learning are clustered around Bangalore. As per the Department of Collegiate Education (2008-09 statistics) there were 63 first grade government and aided colleges in Bangalore urban alone out of the approx. 649 such colleges under the jurisdiction of the Department³³. In addition, there are a vast number of private higher educational institutions that have mushroomed in the district due to which accessibility is high inspite of the increasing influx of students into the capital.
- On the other hand, districts such as Raichur, Koppal and Bellary have lesser access to higher educational institutions, compared to their population and demography. For example, Bellary has witnessed the highest percentage decadal growth rate of population between 2001 and 2011 (as depicted by Census data). As a result, the distribution of colleges in the district vis-à-vis population has remained very low. For instance, there are only about 8 degree (general) colleges (including government as well as private aided - under the jurisdiction of DCE) per 10 lakh population in Bellary at present³⁴.

³³ The Department of Collegiate Education has 344 Govt. Degree (General) colleges, 5 Govt. Law colleges, 292 Private Aided Degree (General) colleges and 8 private aided Law colleges under its jurisdiction (www.dce.kar.nic.in, Retrieved on 10.08.2011)

³⁴ Drawn from: data on number of colleges (2008-09) as per the Department of Collegiate Education website (www.dce.kar.nic.in) and population figures from Census 2011, Provisional Statistics (www.censusindia.gov.in)

- Even in the case of medical colleges, the distribution is skewed towards selected districts in the state and many of northern districts such as Uttar Kannada, Haveri, Gadag and a few in the Southern parts like Chamarajanagar, Chikkaballapur, Ramanagara do not have a single medical college³⁵.

Figure 16: % Government Seats for different streams in Engineering Colleges, Source: Common Entrance Test – 2011



Engineering Colleges: The need for skilled labour in the growing IT/ITeS, Biotechnology industries in Karnataka are largely catered to by the State's Engineering colleges. The adjacent figure shows the distribution of the seats in Engineering colleges which has only 1.4% of the seats for Biotechnology. In absolute terms in 2011 this amounted to only 594 seats for Biotechnology. It was seen earlier in the study that Biotech research itself employs more than 6800 scientists in Karnataka and is growing. Yet again there is a rising demand and young population within the State willing to work but a mismatch in supply due to insufficient seats available to impart the required education.

Polytechnic Institutions: In particular, technical education after secondary education refers to training in polytechnic institutes. As with engineering colleges, polytechnics are also under the purview of the Directorate of Technical Education in Karnataka. There are 273 Polytechnic Colleges in the State, constituting of 81 Government; 44 Government Aided; and 148 Private³⁶. The government's share in the polytechnic colleges unlike the engineering colleges is almost 30 per cent with reasonable control.

District wise Mapping of Polytechnic Institutions: There are district wise disparities in the distribution of polytechnic colleges in Karnataka. Districts like Shimoga, Udupi, Dharwad, and Mysore have more than five colleges and districts like Belgaum, Raichur, Devangere, Chitradurga, Hassan, and CR Nagar have only one or two polytechnic colleges. Since, polytechnic colleges are managed at a district level and generally cater to the needs of the local areas these districts are at disadvantage if they do not have sufficient number of polytechnic institutes to supply relevant local manpower to industries.

Vocational Education & Training (VET): The administrative body for VE Institutions in Karnataka is the Directorate of Vocational Education (under the Department of Primary and Secondary Education). There are about 563 Pre-University (PU) Colleges³⁷ in the State at present. Vocational Training on the other hand falls in the ambit of Directorate of Employment & Training

Industry Perspective on Vocational Education

Where it can help reduce the current Demand – Supply Mismatch in the labour market

- Huge demand for skilled people in banking and finance, manufacturing, electrics and electronics, and construction.
- Even in high growth sectors like automobiles, aviation, steel and mines, food processing and pharmaceuticals, there is a need for a large number of skilled workers.
- Skilled persons are needed in the medical sector which involves the use of lot of electronically or technically operated equipment.

³⁵ District at a Glance document 2008-09

³⁶ Statistics from Department of Technical Education for the year 2009-10

³⁷ Statistics from Department of Vocational Education for the year 2006-07, Sector Analysis, Higher Education and Skill Development, Karnataka State Planning Board, Oct. 2008, pg.12

with three major schemes:

- Craftsmen Training Scheme (CTS) 33 Engineering and 5 Non-Engineering
- Apprenticeship Training Scheme (ATS) As per 1961 ACT-102 Trades
- Modular Employable Scheme

The CTS operates through a network of 158 ITIs/927 ITCs in the State where as the ATS operates through 3075 Industrial and Non-Industrial Establishments in the State³⁸. It is however interesting to note that both Vocational Education as well as Vocational Training modules, attract a similar student influx with a student population of 59003 enrolled in PU Colleges (2006-07) and 59916 enrolled in ITIs/ITCs and other Vocational Training establishments (2006). Moreover the demand for VET is rising especially with the increasing emphasis of demand driven skill development in the country.

e-Learning: Visveswaraya Technological University (VTU) is one of the first universities in the country where an e-Learning initiative has been started with the objective of facilitating distance education and training to the students and faculty in technical courses through satellite and web. The delivery of content is via EDUSAT, which is a satellite dedicated for education and internet. In the VTU-EDUSAT Project, the network infrastructure is used for delivery of live video-based lecture sessions. These sessions are captured, digitized and linked to become part of the overall e-Learning content. At present, 70 colleges of engineering and technology are part of this initiative.³⁹ In yet another e-learning initiative, the Department of Social Welfare, Government of Karnataka and Karnataka Vocational Training & Skill Development Corporation (KVTSDC) have collaborated with the NIIT to set up Learning Labs which comprise Learning Stations (computers) connected via LAN to a central server. The Learning Stations enable students to have online access to Professional Life Skills and Primer courses.

Government Funding: The key areas and schemes where funds have been allocated in higher education in Karnataka are listed below:

Universities & Institutions: According to National Knowledge Commission recommendation the number of Universities for effective knowledge creation and dissemination in Karnataka should be around 50. Over the past budgets new Universities such as a Vijayanagar University in Bellary; Ayurveda Vaidya University, Sanskrit-Veda university, Music & Fine Arts University in Mysore etc have been provided for. Moreover some existing Universities that have been given financial assistance for developing infrastructure and faculty include Tumkur University, Women's University at Bijapur, Kannada University etc.

Engineering: The Government has undertaken proactive measures to expand technical education in Karnataka and has most recently built 10 engineering colleges and 22 polytechnics. The State has provided for building and equipments (Rs 76 crore, 2010-11 State Budget) along with quality enhancement by funding Rs.80 crore for the World Bank assisted project of TEQIP (Technical Education Quality Improvement Programme). This is a Centrally Sponsored Scheme with matching contributions from State Governments and has a selective programme for AICTE approved Engineering Institutions that apply for it. The areas covered include:

- Improving Learning Outcomes/employability for graduates
- Scaling up Postgraduate education and demand driven R&D
- Faculty Development for Effective Teaching
- Capacity Building to strengthen management
- Project Management, Monitoring & Evaluation

³⁸ Statistics from World Bank Report, Jan 2006, Sector Analysis, Higher Education and Skill Development, Karnataka State Planning Board, Oct. 2008, pg.12

³⁹ <http://elearning.vtu.ac.in>

The objective of TEQIP is to produce Centres of Excellence in the State and hence it is largely focussed on Institutions that are adequately equipped for implementing reforms and achieving excellence. In Karnataka, a similar Scheme for enhancing the basic quality indicators of all Technical Institutions is lacking.

Other areas of Higher Education:

- **Medical:** The government has channelized funds for increasing admission capacity of selected medical colleges and for building Super Speciality hospitals.
- **Science & Technology:** In the area of Science & Technology, policies have been initiated to extend facilities of more than 100 degree colleges to provide facility for teaching science, setting up of Institutions of Excellence in areas of science education with focus on district level implementations etc.
- **Industrial Training & Employment:** Funding for setting up and development of Industrial Training Institutes (ITIs) accompanied by provision of special training in language skills, effective communication and personality development in government colleges are also important initiatives that have received funding.

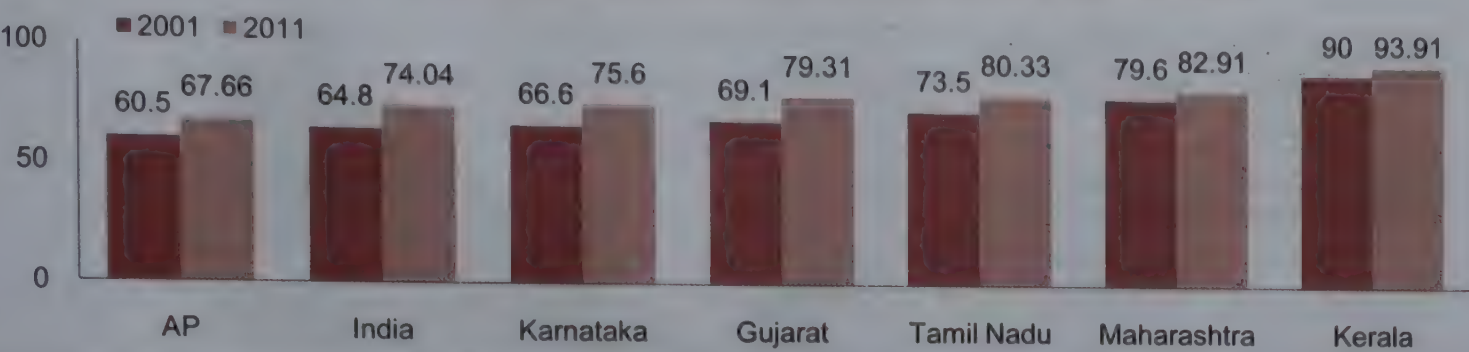
Apart from institutional and statutory vocational training schemes, the Directorate of Employment and Training also conducts several special training programmes in ITIs viz Motor Driving Training Scheme, Advanced Vocational Training System (AVTS), hi-tech programmes in computer-aided drafting, analogue & digital electronics, industrial automation, etc and also special training programmes for tribal people & SC/STs.

In conclusion, over past years Central as well as Karnataka State Government has undertaken efforts to improve the availability and quality of higher education. These efforts are significant yet they need to be further strengthened and aligned to the industrial needs and potential future requirements of the State. For example specific schemes in the upcoming areas like Biotechnology related areas as noted in the section above have not been undertaken. Moreover there is a lack of incentives to encourage students to take Karnataka specific research which can help to enhance academic contributions to the State's development. Women participation specific incentives, expansion of EDUSAT to incorporate larger number of State's colleges and development of a proper system for tracking and monitoring performance of the higher education are some of the requirements which emerge from this study. Karnataka enjoys a demographic advantage. A demand based, market oriented and receptive educational system can play an important part in converting this advantage into dividends.

Literacy in Karnataka

The literacy rate in Karnataka was 66.6 per cent according to the Census of 2001 and it has increased to 75.6% as per Census 2011. The figure below shows the state in comparison to other states in terms of literacy rate. Although the literacy rate in the Karnataka is higher than the national average, it is still behind comparable states like Kerala, Maharashtra, Tamil Nadu and Gujarat. Moreover interstate comparisons of literacy rates reveal that the rank of Karnataka has worsened from 28 in 2001 to 31 as per Census 2011. A demand side perspective is obtained through analysis of Primary survey, where majority respondents stated that functional literacy is of higher value than basic school education to ensure a better quality of life.

Figure 17: Literacy Rates in % for leading Indian States, Census 2001 & Census 2011



District wise Mapping of Literacy Rates: Delving deeper to study the district wise variations in literacy rate, wider disparity can be seen at the district level where some of the districts have achieved the literacy rates of more than 80 per cent and at the same time many are still below 65 per cent. The literacy rate in the coastal districts and Bangalore is higher than the rest of the districts in the state. Some salient features of the State with respect to district wise literacy trends (Source: Census 2011, Provisional data, www.censusindia.gov.in) are as follows:

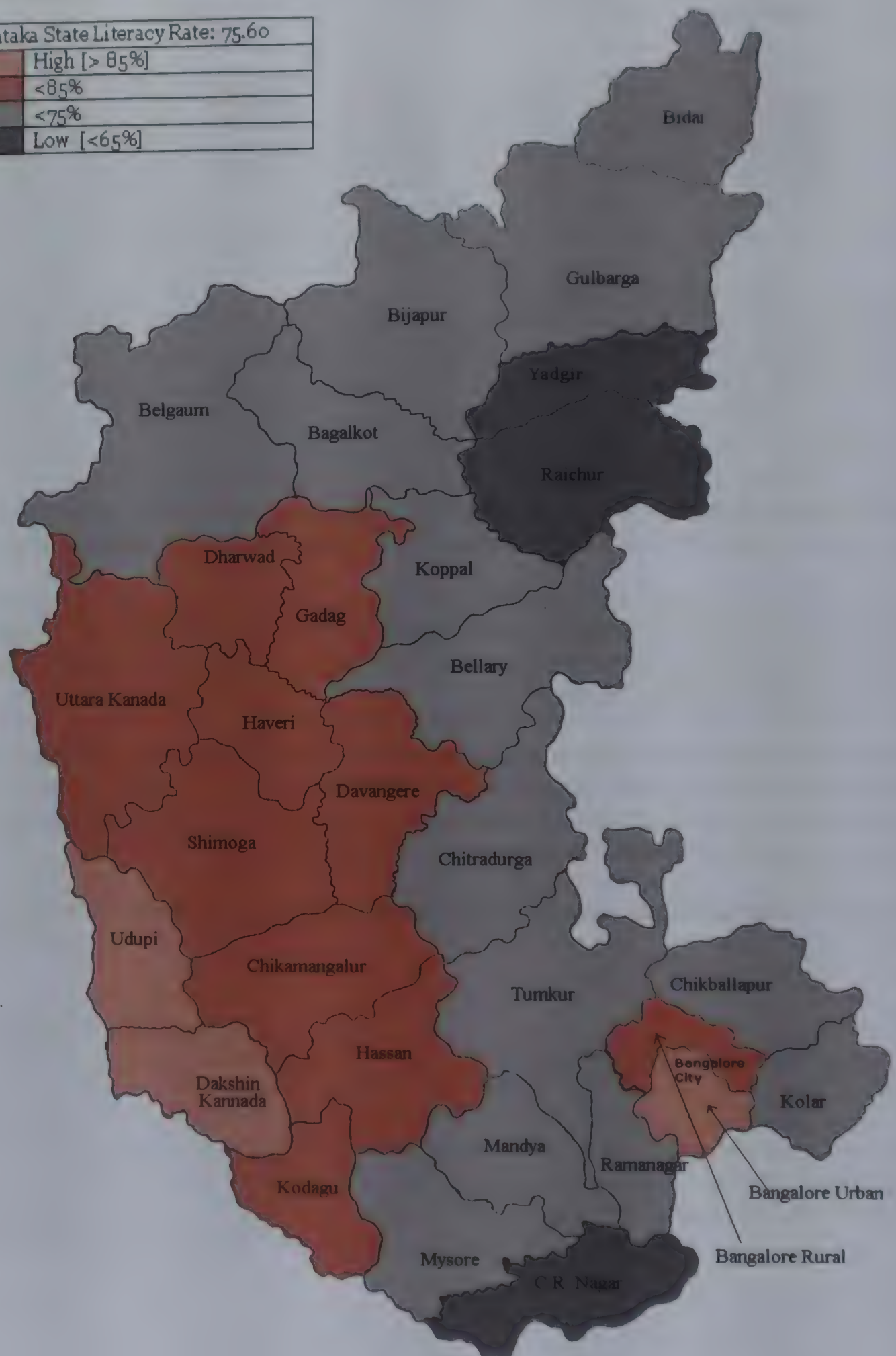
- Dakshin Kannada has the highest overall (88.62%) and male literacy rate (93.31%) in the State, followed by Bangalore Urban with an overall literacy of 88.48% and male literacy rate of 91.82%.
- Raichur (overall: 60.46%, male: 67.88%) and Yadgir (overall: 52.36%, male: 63.33%) have recorded the lowest literacy rates in the State. Though Yadgir, is lowest in terms of the literacy rank compared to other districts it has shown a decadal (2001 -2011) percentage increase in the number of literates of around 66.44% which is highest in the State.
- In terms of female literacy, Bangalore has recorded the highest literacy rate of 84.80% with the State wide average of 68.15%. In terms of male and female literacy rates, ten districts in the State have the same ranking for both. However, districts like Gadag have huge disparity, with ranking of female literacy at 17th place amongst 30 districts and that of male literacy at 10th place.

The figure below maps the overall district wise literacy rates as per Census 2011 (provisional data)

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Figure 18: District wise Literacy as per Census 2011

Karnataka State Literacy Rate: 75.60	
	High [> 85%]
	<85%
	<75%
	Low [<65%]



Source: Data from Census 2011 (Provisional data, www.censusindia.gov.in), compiled by PwC

Functional Literacy: General approach to interventions for improving adult literacy is to increase skills in reading and writing basic language, numbers and simple calculations. However, it is also essential to provide basic inputs to bring confidence to handle day to day activities like information on savings, postal and banking transactions, keeping basic accounts, participation in Self Help Groups for economic and social self-reliance, awareness on relevant government programmes and schemes, etc.

For example, Primary survey indicates that awareness levels regarding important legislative provisions are either low or moderate among the respondents. While respondents were aware of legislations related to Prohibition of Child Marriage (68%), Prevention of child labour (63%), Dowry Prohibition Act (61%), Right to Education Act (60%) and Prenatal Diagnostic Techniques Act (48%); awareness levels for other important legislative provisions were found to be low. Only 16% of the respondents were aware of the Prevention of Domestic Violence Act, 38% were aware of the Consumer Protection Act.

There have been some disjointed efforts undertaken for promoting functional literacy in the State but there is a need for strategic and collaborated efforts to be undertaken to enhance the functional literacy of the people.

Health Systems and methods of Knowledge Dissemination

The achievement of the Karnataka Vision 2020 goals in the health sector is closely linked to effective dissemination of basic healthcare practices. Sustained improvement in the health indicators warrant a comprehensive approach encompassing progress in all socio-economic sectors like increase in marriage age, birthing practices, traditional child rearing, community based participation, use of appropriate technology, equitable distribution and gender based implications. This emphasizes on the need for health workers at all levels, especially at the grass roots to understand and facilitate dissemination of this knowledge. Moreover the health workers need to be skilled with requisite communication skills to educate and change behaviours.

Knowledge sharing and use of Information & Communication Technology (ICT) play an important role in health sector improvement. Aspects like *telemedicine* have been used as a supplement & support system, where the health systems have not been fully established. We delve deeper into the Institutions that cater to health sector needs, their status and requirements of the citizens as depicted through the primary survey.

Health Institutions

Karnataka has a wide institutional network providing health services both in urban and rural areas. There are 17 district hospitals, 10 other hospitals, 29 Autonomous & Teaching Hospitals, 325 Community Health Centres, 2193 Primary Health Centres, and 8143 subcentres, Under Ayush (Ayurveda, Yoga, Unani, Siddha and Homeopathy) 103 hospitals with a bed strength of 1595 and 659 dispensaries are functioning. The State has a doctor to population ratio of 1:10018 and bed to population ratio of 1:1120. Karnataka’s population has registered a decadal growth rate of 17.5 per cent in 1991 to 2001 compared to 21.12 per cent during the preceding decade manifesting a declining trend⁴⁰.

Primary Health Centres (PHCs): are the first point of contact in a district with qualified doctors and a nurse. These are based within close proximity of the societies and are primary knowledge carriers in the health sector. The numbers of staff and health facilitators is vitally important in such institutions of health as they cater to the needs of the masses at micro level. The table below presents an analysis of shortfall in staff positions required in PHCs/CHCs in Karnataka, in 2008. The shortfall in the number of paediatricians at CHCs is almost 64 per cent. The shortfall in the technical support staff like radiographers, laboratory technicians, and health workers is also enormous. **This shortfall in number of staff members**

⁴⁰ ‘Karnataka at a Glance document, 2009-10

adversely affects the delivery of health care services thus restricting the flow of knowledge dissemination.

Table 6: Staff requirements in Primary and Community Health Centres in Karnataka, MoH&FW 2008

Particulars	Required	In position	shortfall	%
Multipurpose worker (Female)/ANM at Centres & PHCs	10338	8028	2310	22%
Health Worker (Male) MPW(M) at Sub Centres	8143	3762	4381	54%
Health Assistant (Female)/LHV at PHCs	2195	1170	1025	47%
Health Assistant (Male) at PHCs	2195	837	1358	62%
Doctor at PHCs	2195	2814	-	-
Obstetricians & Gynecologists at CHCs	323	215	108	33%
Physicians at CHCs	323	192	131	41%
Pediatricians at CHCs	323	116	207	64%
Total specialists at CHCs	1292	691	601	47%
Radiographers	323	30	293	91%
Pharmacist	2518	1983	535	21%
Laboratory Technicians	2518	1242	1276	51%
Nurse/Midwife	4456	1647	2809	63%

Source: RHS Bulletin, March 2008, MoHFW (<http://mohfw.nic.in/NRHM/State%20Files/karnataka.htm>)

National Rural Health Mission (NRHM): Through NRHM fixed sums have been earmarked for the betterment of health outcomes. Under this scheme, the Government envisaged appointment of female Accredited Social Health Activists (ASHA) in every village to act as an interface between local health functionaries and the village and to be accountable to the Panchayats. A recent review (Bulletin on Rural Health Statistics in India 2011) of the NRHM also indicated a shortage in the availability of specialists such as surgeons with Karnataka reporting a total shortfall of 47%.

Anganwadi Centres: Anganwadi centres were formed under the Integrated Child Development Scheme (ICDS) to cater to the needs of the development of children between 3-6 years. Anganwadis have gained prominence in Karnataka due to their wide presence in all regions of the State and their impact on improving child and pregnant/lactating mothers' health conditions. Since, it has been ensured that every village should have an Anganwadi, these ICDS centres have a huge potential of turning into a vibrant centre of dissemination of knowledge related to health, especially issues related to children, mothers and other general hazards. Karnataka itself has a total network of 63306 Anganwadi centres distributed throughout the state (2010)⁴¹

'If they put up details on new schemes in the Anganwadi centres (AWC), we can read about it when we pass by and tell the others about the scheme'

(View of a rural development beneficiary in FGD)

⁴¹ Press Information Bureau, GoI website (<http://pib.nic.in/newsite/erelease.aspx?relid=70966>)

Figure 19: District wise number of Anganwadi Centres in Karnataka (per 10000 populations) in 2008-09.



Source: Districts at a Glance documents, 2008-09

The figure above gives the district wise spread of Anganwadi Centres in Karnataka. The key observations are:

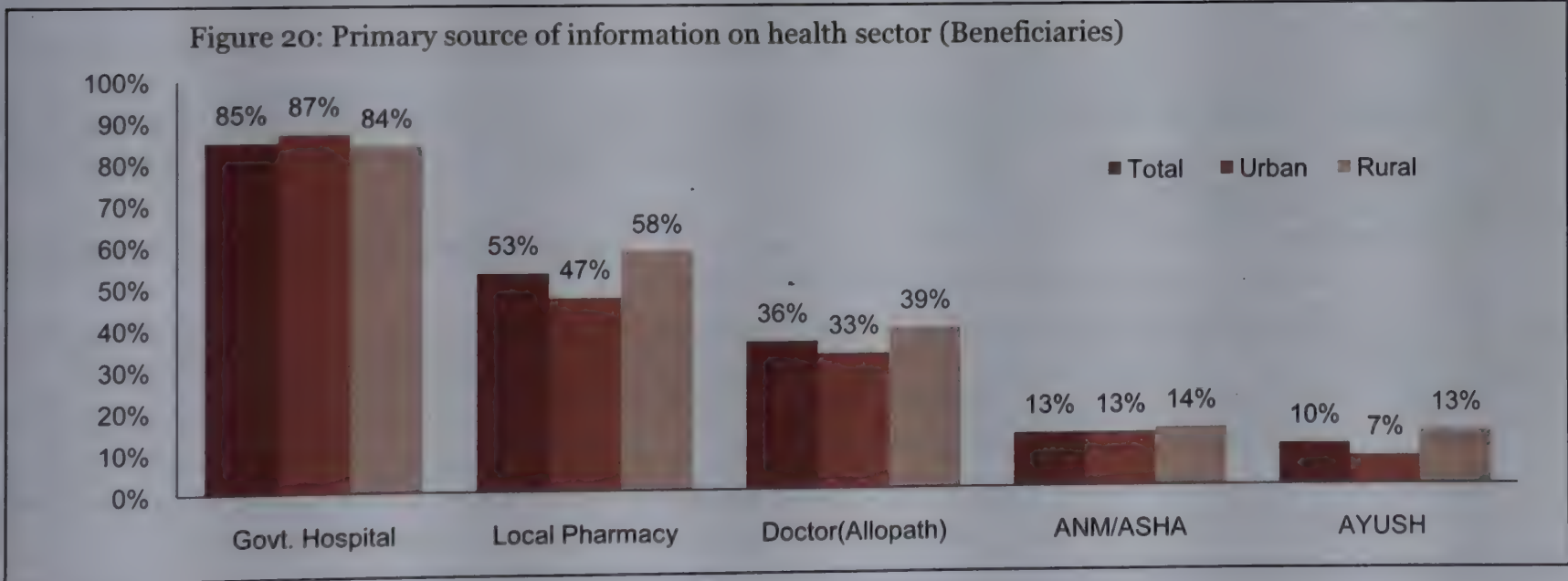
- The state has an average of 10.340 Anganwadi centers per 10000 populations and a district-wise analysis shows that the maximum is 15.440 in Kodagu and the minimum is 2.379 in Bangalore.
- Districts like Davangere, Mysore, Dharwad, Bellary, Raichur, Gulbarga, Bidar, Koppal, etc fall at the bottom of the list in terms of availability of Anganwadi Centers.

Primary Survey respondents on Health Sector Institutions and their functioning

- 94% respondents felt that infrastructure facilities at government health centres need to be strengthened.
- There is adequate number of health institutions at all levels, largely conforming to population and area norms. However, it is not just shortage of staff, but erratic supply of equipment, drugs and disposables, and lack of basic amenities like water and electricity in government hospitals and healthcare centres that have resulted in poor quality of services at these centres.

Preferred Sources of Health Information

Figure 20: Primary source of information on health sector (Beneficiaries)



- The primary survey indicates that the Government hospitals are the first level of information for about 85% of the respondents. As seen in the figure, a large majority (53%) also relied on the local pharmacy followed by the local doctor (36%) for first level of information on health related issues. Only a small

portion of respondents sought first level of information on health related issues from ANM/ ASHA workers (13%), AYUSH practitioners (10%) and community/ village members (7%).

- In addition, currently local health centres provide information on timings, doctor qualifications and preventive health practices. While 44% agreed that the centres displayed emergency response numbers and 41% could access schedules for vaccines/ health camps, health related information not easily accessible were fee structures for procedures and IEC schedules.
- Among service providers in the health sector 80% stated that there will be a high level of acceptance to new technologies within their organization and among beneficiaries. ICT in health can help to make the system of information dissemination more effective and updated. The primary road blocks however on a wider scale in the state were felt to be lack of training (61%) and low education levels (53%).

In conclusion, resource profiling provides a fair picture of the current status, initiatives and fund channelization in the health sector. Various efforts have been undertaken for infrastructural development and better management of health centres. The State is already working on providing this facility to all district hospitals. There is a need for convergence and optimisation of initiatives and resources to expand the reach and coverage of basic health care facilities. Simultaneously, there is a need to focus on the quality of services and develop medical facilities to service the changing needs of the society – specifically covering different target groups like children, women, physically disabled and ageing population.

Agriculture Systems and modes of Knowledge Dissemination

Agriculture is the backbone of the Indian economy. In Karnataka as well it has been one of the important sectors in terms of employment engaging about 50 per cent of the workforce. However, the contribution of the primary sector, i.e. agriculture and allied sectors is 17% only. This highlights the requirement of increasing productivity in Karnataka with effective knowledge dissemination being a key driver in the process.

Knowledge Sharing initiatives

Post the closure of the National Agricultural Extension Project (NAEP) in 2003 many state governments initiated different extension approaches. The changing needs of agriculturists and farmers especially in the areas of agricultural policy, technology, policy etc have been incorporated in different states in myriad ways. Some of the initiatives taken by states like Rajasthan, Andhra Pradesh, Maharashtra, and Kerala are summarised below.

- **Rajasthan:** Followed a group based approach through a Kisan mandate (forming groups of 20 farmers). The State is also encouraging NGOs to participate particularly in the far flung areas where public extension is comparatively weak
- **Maharashtra:** Adoption of a single window system by merging the Departments of Agriculture, Soil and Water Conservation and Horticulture at the operational level.
- **Kerala:** Followed decentralisation of the functioning of the Department of Agriculture by creating offices (Krishi Bhavans) in all panchayats, which take all major decisions regarding agricultural extensions.
- **Andhra Pradesh:** Agricultural University has established District Agricultural Advisory Technology Centres (DAATC) for technology refinement, diagnostic visits and for organising field programmes
- **Karnataka:** In comparison to most States, Karnataka has been receptive to the changing farmer needs and undertaken initiatives like the Raitha Mitra Yojana to disseminate latest technology. Some of these initiatives are detailed below:

Raitha Samparka Kendra – Farm Clinics in Karnataka: To provide extension service to farmers and encourage them to adopt modern technologies, 745 Raitha Samparka Kendra are established in each sub-

block of the State, under the Raitha Mitra Yojana Scheme. This programme has been implemented in around 27 districts, 176 taluk and 745 Hoblis in the State⁴². The main functions of these Kendras are:

- providing updated crop production related know-how
- critical agricultural inputs like primary seed and soil testing facilities
- arranging interface with public and private sector technologies
- arranging field level trials, and demonstrations to increase the rate of adoption of new technologies

The farmers can visit such Kendras and avail the required farm information and other supporting services and benefits. Recently, arrangement has also been made to seek information over phone. The technical staffs of RSKs visits all the villages of the sub-block as per the fixed visit schedule and arrange farmers meet and provide necessary suggestions. Field visits are also arranged to facilitate adoption of new technologies.

In the agriculture sector, over 55% respondents went to Raitha Samparka Kendras (RSK) or family/ community members for their first level of information regarding agriculture related information.

Pre-Kharif and Pre-Rabi Planning Workshops: The Department of Agriculture in Karnataka organises pre-Kharif and pre-Rabi Planning Workshops involving department officers, field level functionaries, university of agricultural sciences scientists, officers of line departments and related input agencies. These workshops are organised at different locations, based on agro-climatic zones, soil types, cropping and rainfall pattern. State level workshops are followed by district level and taluk level workshops.

- Bi-monthly meetings are conducted between extension functionaries and research scientists that provide a forum for in-service training to enhance the subject matter expertise of department officers to better meet the technological needs of the farmers.
- Taluk level fortnightly workshops are aimed at continuously upgrading and updating professional skills of the extension workers.
- District Diagnostic teams comprising of specialists from University of Agricultural Sciences and senior officers of the department in the district under the leadership of Joint / Deputy Director of Agriculture have been constituted. These teams tour their respective districts before the onset of the Kharif/ Rabi season to assess the adoption rate of technologies, identify the existing constraints and prepare the status report that form the basis for the bi-monthly meetings.

Agriculture Technology Management Agency (ATMA): The main objective of this scheme is to bring coordination among all stakeholders of agricultural extension including: agriculture and allied departments working under Panchayat Raj System, State Agricultural Universities, Private entrepreneurs, input dealers and farmers. The extension activities are implemented through Taluk level ATMA Implementation Committees monitored by District Level ATMA Steering Committees. During 2007-08, the scheme was extended to all the districts of the state.

In addition there are various other initiatives which lead to Knowledge dissemination in the State. In the Primary survey in addition to RSKs, farmers reported that they obtained required knowledge from Krishi Vigyaan Kendras (29%), Agricultural Universities (26%), Kisan Call centres (23%) and Phone-in programmes (21%)

⁴² <http://raitamitra.kar.nic.in/phoneRSK.htm>, Retrieved 5.08.2011

Primary Survey on Innovation and Technology in Agriculture

Views of agriculture sector respondents in Karnataka

- 71% respondents had good access to information related to prices of agricultural inputs, and 60% had access to rural credit facilities. The present availability of information related to water analysis and supply (11%), schedule of extension works (18%), weather forecasts (23%) and soil sample analysis (25%) was limited to less than quarter of the respondents. The following areas have been identified by the respondents for coverage by government training and demonstration activities:
 - Use of new agricultural inputs including seeds, fertilizers, pesticides;
 - Demonstration of innovative agricultural practices and watershed management.
- In case the government was to design an agriculture portal, 51% respondents felt that it would be useful in their farming activities. The information that would of use on such a portal could include:
 - Information on rural credit facilities
 - Post harvest facilities (warehousing, transport, packaging etc.)
 - Market prices of produce
 - Details and schedules of agriculture extension works
 - Information on various government schemes.

Government Funding

The Economic Survey of 2009-10 gives following information about the budgetary allocations made to the agriculture and allied sectors:

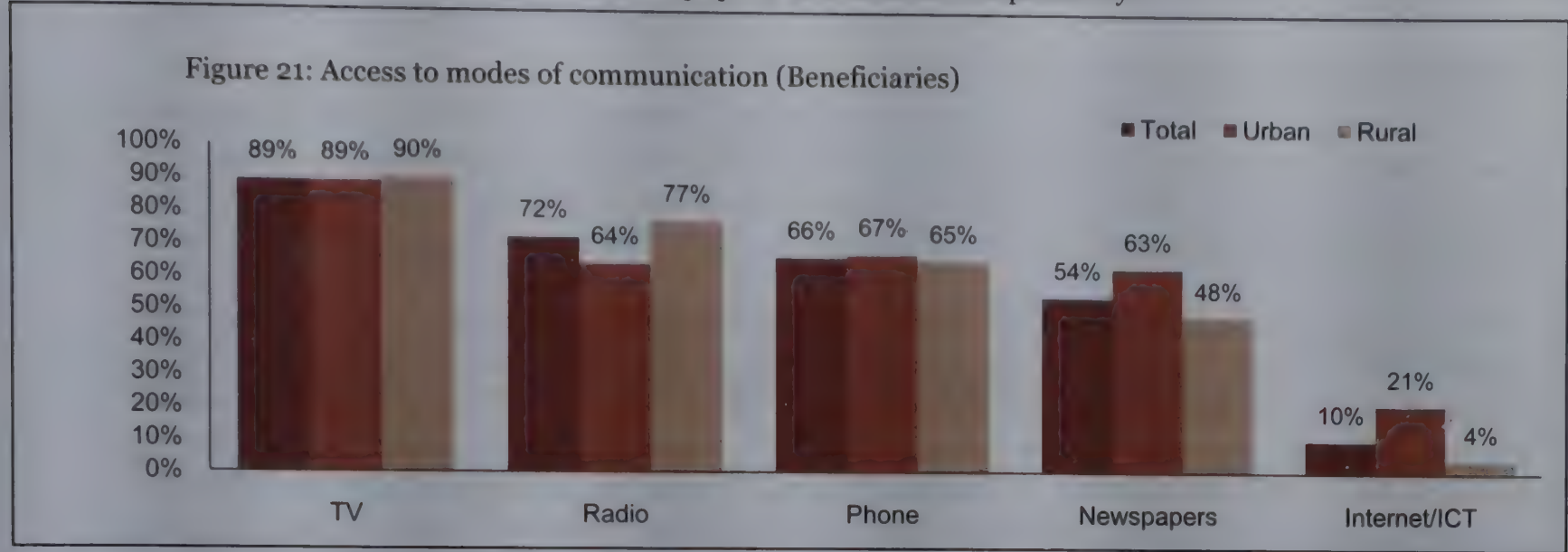
- During 2008-09, an amount of Rs.314.14 crore was allocated and funds were fully utilized for implementation of the schemes related to Agriculture, Horticulture, Animal Husbandry, Fisheries and Agricultural marketing departments.
- During 2009-10 an amount of Rs. 410 crore has been provided for implementation of schemes/projects
- Up to November 2009, Government of India has approved for Rs. 321.10 crore and released grants of Rs.153.75 crore as first instalment. Implementation of the schemes is under progress.
- An amount of Rs.172.26 crore has been earmarked for agriculture department for implementation of the following schemes: Bhoo- Chetna, Karnataka Farm Mechanization Mission, Karnataka Seed Mission, etc.

In conclusion, considering Agriculture is the core sector in the State a large quantum of funds have been channelized and varied initiatives have been undertaken to give it a constant boost. The contributions of the sector to the State's GDP though, shows that there is an evident need of a sectoral revival through 'Innovations', 'ICTs' and further use of mediums of mass communication including TVs and Radios in the sector, which would expedite the process of cultivation by linking farmers with the latest technology and equipments.

Methods of Mass communication

For dissemination of knowledge among the masses, there can be different mediums and it is not limited to formal mediums like classroom education. Radio, newspapers, magazines, weeklies, etc have been historically very important mediums of dissemination of information as well as knowledge. Among all components of media, newspapers and magazines still have the most extensive and intensive outreach among the masses. For fulfilling the objective of forming a Knowledge Society in Karnataka, need arises to investigate the coverage of these means to identify and capture sections of the population which are connected through them.

Increasing the level of awareness about various legislative provisions, especially among vulnerable sections of society, can be the first step towards empowering these sections. As seen in the figure below, the survey data shows that television is the most widely accessible mode of information and communication among respondents followed by radio, telephone, newspapers and internet respectively.

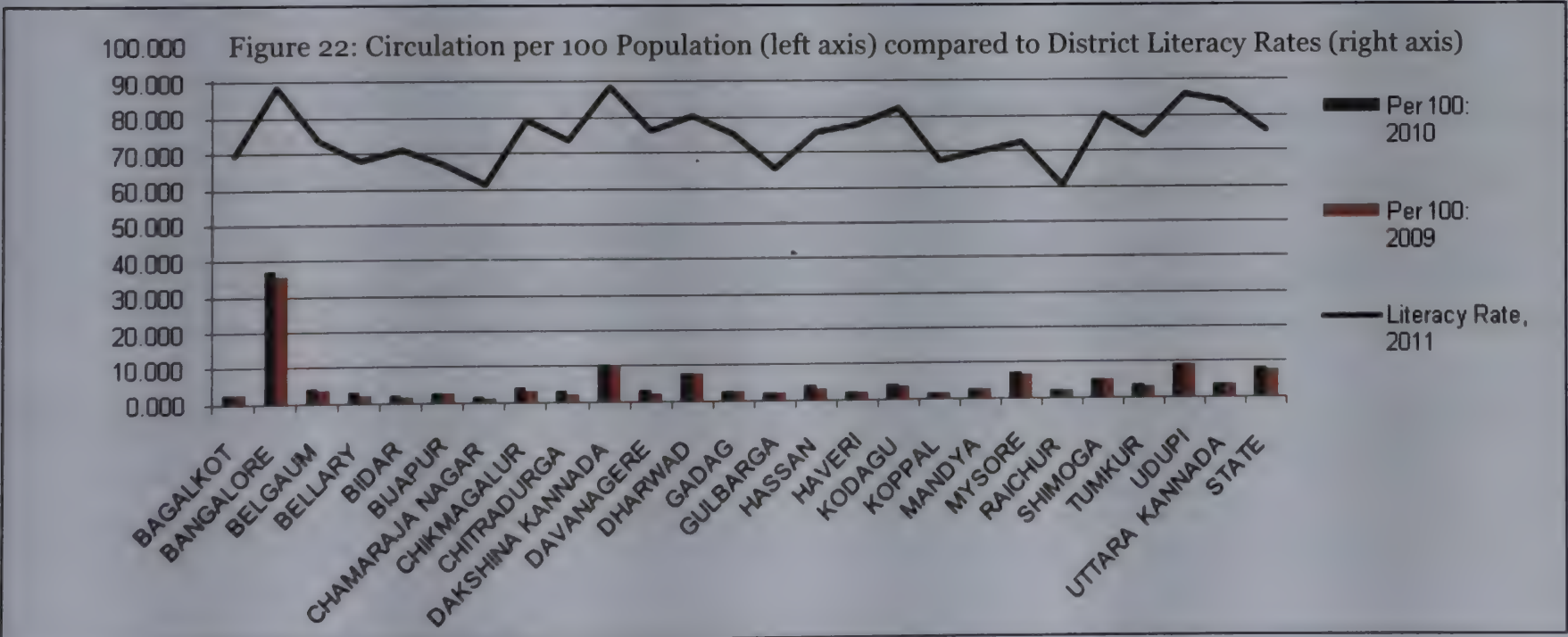


- In line with the above, media (TV, radio and print media) was the first level of information for 75% of the respondents on various government schemes. According to respondents, use of media was the preferred mode to disseminate information in multiple sectors like higher education, health, agriculture and public services.
- Moreover, with betterment of literacy rates and changing technology, mediums like newspapers and eventually internet are going to be the drivers of knowledge dissemination in the State. We study some of these mediums in details to analyse their present status and projected growth.

District wise spread of selected mediums of mass communication is detailed below.

District wise Newspaper Readership

According to the Indian Readership Survey results for Quarter2, 2010 most of the top 10 dailies in Karnataka have surged ahead on the average issue readership (AIR - the number of readers of that publication who have claimed to have last read it within periodicity). In addition it is important to note that the number of newspapers and magazines in circulation (per 100 populations) in Karnataka has increased from 7.8 in 2009 to 8.34 of 2010.



Source: National Readership Survey by ABC of the period Jan-June 2009 & 2010 and Literacy Rate as per Census 2001.

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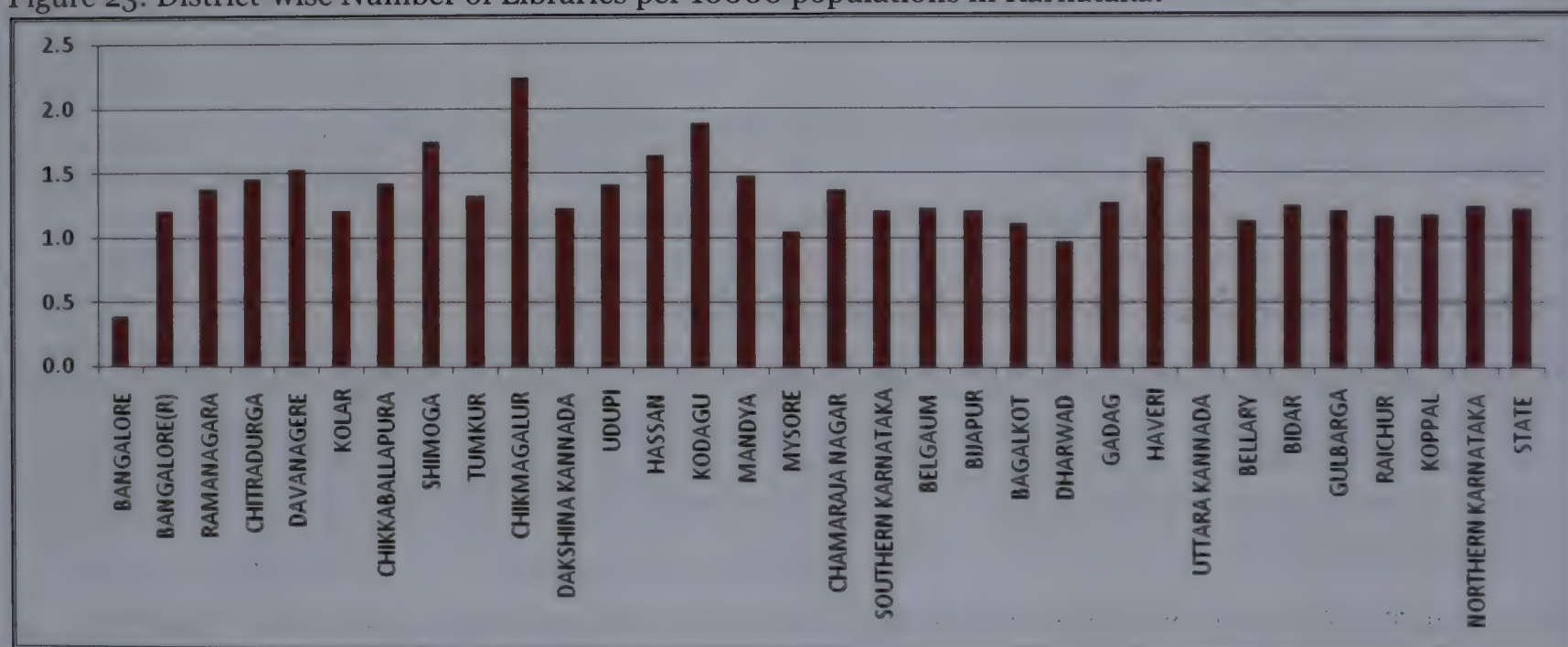
It can be seen that in most of the cases the circulation of newspapers and magazines is directly related to the literacy rate. The demand and supply of newspapers is higher in larger literate populations. **Kodagu stands as an exception which has a literacy rate of 82.5, far higher than the state average – but its readership rate is 3.74, much lower than the state average.**

District wise spread of Libraries

Like readership of newspapers and magazines, public libraries are also vital mediums for knowledge dissemination. Through the Karnataka Public Libraries Act (1965), each panchayat of the State is mandated to have at least one public library. The state has come a long way and has developed a network of 6451 public libraries (2009). However, there are just 1.2 libraries per 10,000 of population in Karnataka (Figure below).

There are district wise disparities in the availability of libraries varying from average 2.2 libraries per 10,000 populations in Chikamagalur to only 0.4 libraries per 10,000 populations in Bangalore. Districts like Shimoga, Hassan, Kodagu, Haveri and Uttar Kannada are in a marginally better position where as Dharwad, Bellary, Gulbarga, Mysore etc have lesser availability. Access to libraries emerges as a concern in these districts. Along with the number of libraries it is also critical to understand how many people use these facilities. Understanding about the utilisation of these libraries (incl. time of its' working), number of books, system of upgradation etc is important and should be looked into on a periodic basis to ensure that the system is receptive to changing needs.

Figure 23: District-wise Number of Libraries per 10000 populations in Karnataka.



Source: Directorate of Economics and Statistics, Karnataka, (2009)

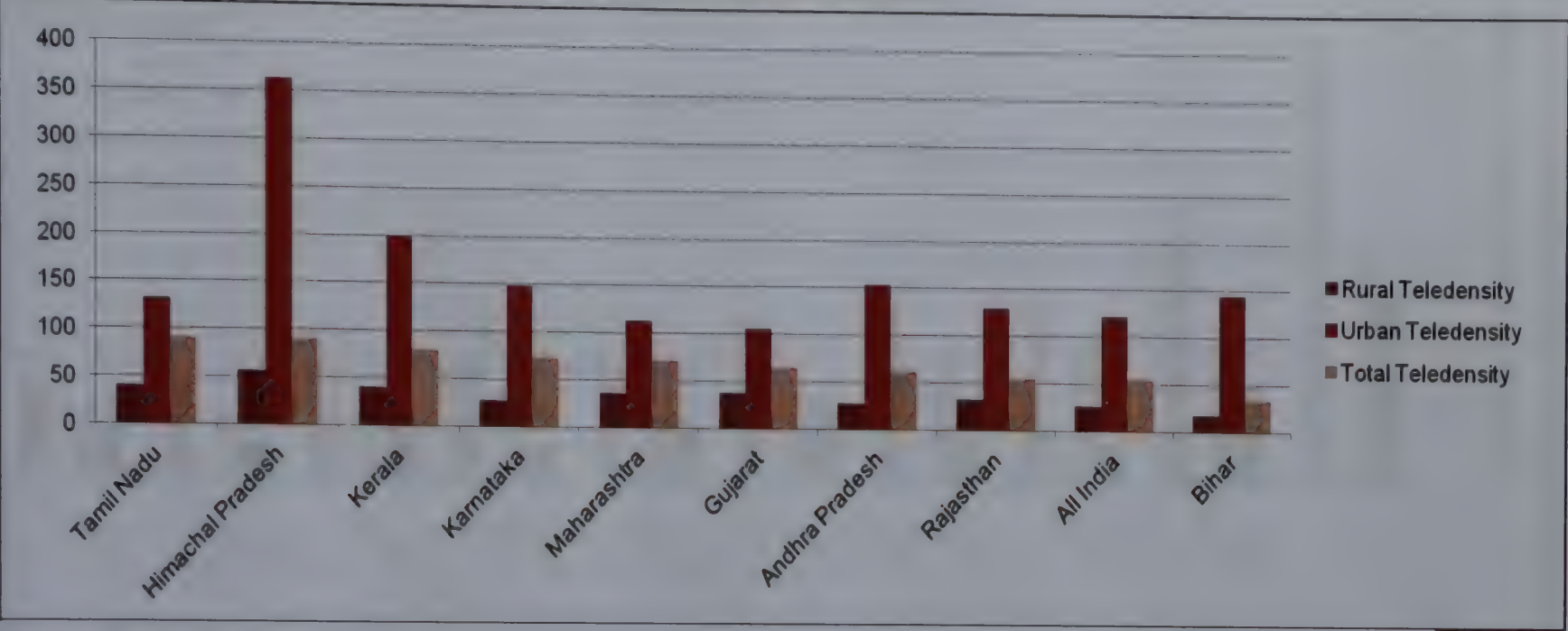
Wireless Teledensity

Wireless Teledensity represents the number of wireless connections(including mobile phone connections, wireless landlines etc) per 100 population. On an average in India 55.62 connections exist per 100 population whereas the state average is 72.83 (Figure 24). Other observations with respect to Karnataka include:

- In terms of urban wireless teledensity, Himachal Pradesh, Kerala and Andhra Pradesh are much better connected than other states including Karnataka.
- Karnataka (28) performs much worse in terms of rural wireless teledensity and is only slightly above the national average of 27.32.
- However, delving deeper into rural connectivity details it is observed that in terms of **coverage** specific – 91% of the villages in Karnataka have mobile coverage and out of the total 27481 inhabited villages, 25000

of them have been connected with wireless networks (TRAI, 2008). **This shows that though there is coverage of wireless connections, the availability and spread is skewed.**

Figure 24: State-wise tele-density in rural and urban areas in 2010



Source: The Indian Telecom Services Performance Indicators - TRAI, 2010

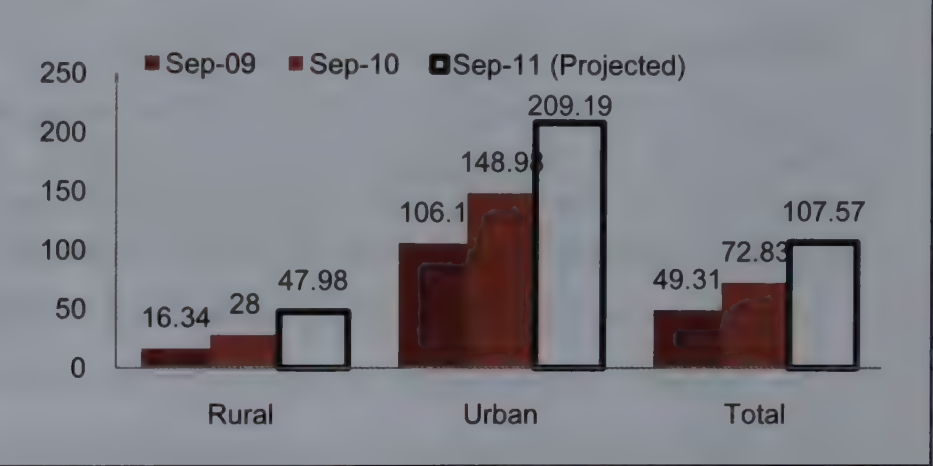
Mobile Phones: It is one of the most significant mediums of knowledge dissemination worldwide. Wireless tele-density (including mobile phone connections) is increasing each year in Karnataka with September 2011 projections being 47.98 connections per 100 population for rural areas and 209.19 connections per 100 populations for urban areas. This is illustrated in the adjoining figure.

Internet availability

The Internet has enabled entirely new forms of social interaction and activities due to its basic features such as widespread usability and access. In terms of public users, number of internet subscribers in Karnataka shows a steady increase of nearly 25% from 10.9 lakhs in 2009 to 13.6 lakhs in 2010⁴³. This reflects the increasing comfort with new technologies and exposure as also depicted in the survey results.

The figure below shows the number of internet subscribers in some of the states of the country in different speed bands. Karnataka is one of the leading states in terms of absolute number of subscribers ahead of Tamil Nadu, Andhra Pradesh, Kerala and Gujarat.

Figure 25: Wireless Tele density growth projections (drawn from TRAI data)

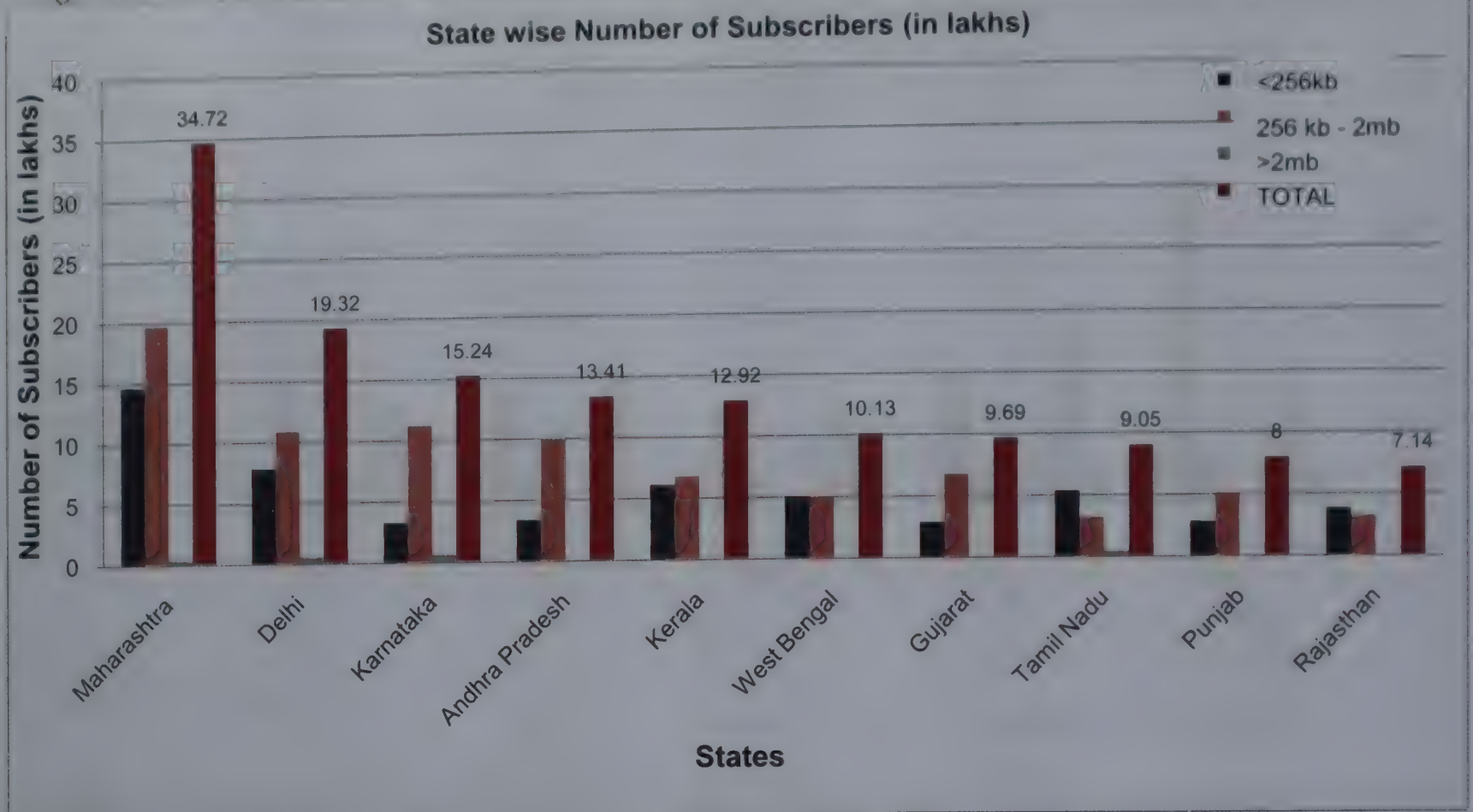


Perspectives of Primary Survey respondents on Internet

- Majority of urban respondents (66%) thought access to ICT/Internet had enhanced their access to information.
- Most of the service providers (83%) felt that use of ICT/ Internet had been an effective mode to disseminate information among other service providers.
- Only 33% rural respondents agreed that access to computers and internet had made access easier.

⁴³ <http://www.indiastat.com/Telecommunication/28/Internet/143/461082/data.aspx>

Figure 26: State-wise number of subscribers of internet in different speed bands, TRAI -2010.



Information Education Communication (IEC) Strategies

A large majority of respondents felt that **Information Education Communication (IEC)** activities carried out by individual departments had failed to reach the masses. Only 39% of primary survey the respondents had attended an IEC programme conducted either by the government department or NGO in the last one year. **The main reasons given by respondents included:**

- **The schedule of the programme is not well publicized.**
- **Held at a time not convenient for people to attend.**
- **Impression that these programmes have no immediate utility.**
- **They are usually held at district/ taluk headquarters and not at individual village level, making it difficult to attend.**

However, among those that had attended these programmes, 73% education related and 58% health related respondents found the content of these programmes to be useful.

NGO/CSR Initiatives in Knowledge Dissemination

Non Government Organizations (NGOs) have their intervention in all spheres of the society. They are active with an array of objectives, roles and responsibilities. Whatever their objectives or area of activities may be, their presence has led to dissemination of knowledge and ideas to the bottom of the society. In Karnataka also, there are a lot of NGOs which are actively disseminate knowledge in different sectors. **In fact the primary survey revealed that 8% of the respondents reached out to the NGOs for first level information.**

There are many national and international NGOs active in the state like Akshara, Pratham Foundation, Action Aid, Navadeepa, etc. Funding for these organisations comes from donations from government, international donor agencies, corporate houses etc. In addition, the most coveted examples of Corporate Social Responsibility (CSR) Initiatives include those undertaken by Azim Premji Foundation, Infosys Foundation, etc. Funding in these types of philanthropic organizations comes from their parent corporate houses as they

tend to donate a certain part of profit for these social welfare activities. The major areas of such activities are as follows.⁴⁴

Key Areas:

- Capacity development of existing talent at state and district levels.
- Partner with government for on the ground improvements in education /allied areas.
- State level linkages, advisory services and advocacy.
- Develop standards of excellence for schools, teacher education institutes and other educational institutes.
- Assess institutions against these standards
- Facilitate improvements and create awareness

Key Sectors:

- Healthcare: Primary health, Children and Mother Health, nutrition, AIDS, etc.
- Rural development and social rehabilitation: Livelihood, Panchayati Raj Institutions, Women empowerment, Empowerment of other deprived sections of society.
- Learning and education: Primary education, Quality of education, Secondary and higher education, Access to education, etc.
- Art and culture: Revival, preservation, etc of traditional art and culture forms.

Knowledge Networks

‘In an age of rapidly proliferating knowledge, the central domain is a social network that absorbs, creates, transforms, buys, sells, and communicates knowledge. Its stronghold is the knowledge embedded in a dense web of social, economic, contractual, and administrative relationships’ (Badaracco, 1991)⁴⁵.

The term ‘Knowledge Networking’ is used to signify a number of people, resources and relationships among them, who are assembled in order to accumulate and use knowledge primarily by means of knowledge creation and transfer processes, for the purpose of creating value. The Framework of Knowledge Networks comprises the following components⁴⁶:

- **Actors:** individuals, groups, organizations; relationships between actors, which can be categorized by form, content and intensity;
- **Resources:** used by actors within their relationships, and institutional properties, including structural and cultural dimensions such as control mechanisms, communication patterns, etc.

In Karnataka also, there are a lot of knowledge networks active in different areas. It varies from government-private partnership to a completely independent corporate initiative with a range of objectives and targets. These networks are very important contributors to dissemination of knowledge given the specific area they

⁴⁴ Drawn from NGO websites and discussions from stakeholders
⁴⁵ Badaracco, J. L. (1991): The Knowledge Link: How Firms Compete Through Strategic Alliances, Harvard Business School Press, Boston.
⁴⁶ Andreas Seufert, Georg von Krogh, Andrea Back: Towards Knowledge Networking.

aim to cover. Some of the examples⁴⁷ given below would give us an idea of how these networks are instrumental in the process of dissemination of knowledge.

- **Kanaja – Kannada web portal:** Kanaja has information in Kannada in all branches of knowledge - agriculture, science, history, literature etc. It had been launched by the Karnataka Knowledge Commission on 5.12.2009 and also has a component called Hear Kanaja - software which reads the text on the portal for the visually challenged.
- **Nasscom Knowledge Network (NKN):** NKN is a network of tele-centres that provide access to knowledge and information in education, livelihood, health, to improve the capacities for employment and entrepreneurship of underserved communities in rural and urban areas. The centres are variously called as knowledge centres, learning centres, resource centres and information and service centres.
- **Karnataka Learning Partnership (KLP):** The Karnataka Learning Partnership (KLP) is a unique public-private partnership between the Government of Karnataka, through the Department of Primary and Secondary Education with support from Sarva Shiksha Abhiyan (SSA), and the Akshara Foundation, a non-profit organization. Starting in July 2006, KLP conducted a 45-session accelerated reading intervention for all children in Bangalore schools who could not read a simple sentence.
- **National Knowledge Network (NKN):** The NKN is a state-of-the-art multi-gigabit pan-India network for providing a unified high speed network backbone for all knowledge related institutions in the country. The purpose of such a knowledge network goes to the very core of the country's quest for building quality institutions with requisite research facilities and creating a pool of highly trained professionals. The NKN will enable scientists, researchers and students from different backgrounds and diverse geographies to work closely for advancing human development in critical and emerging areas. At present, 252 educational and research institutions have been connected by the National Knowledge Network. Specifically the Karnataka based institutions are listed below:

Karnataka based Institutions already connected to the National Knowledge Network

- Tumkur University, Bangalore
- Kuvempu University, Shimoga
- Indian Institute of Science, Bangalore
- National Institute of Mental Health and Neuro Sciences, Bangalore
- C-DAC, Knowledge Park, Bangalore
- National Centre for Biological Sciences, Bangalore
- C-DAC, Electronic City, Bangalore
- Raman Research Institute, Bangalore
- Indian Institute of Astrophysics, Bangalore
- Centre for Soft Matter Research, Bangalore
- Central Food Technological Research Institute, Mysore
- Centre for Mathematical Modelling and Computer Simulation, Bangalore
- The Indian Institute of Horticultural Research, Bangalore
- National Aerospace Laboratories, Bangalore
- Central Power Research Institute, Bangalore
- Central Plantation Crops Research Institute, Bangalore
- Central Institute for Research on Buffaloes, Hissar
- ISRO Satellite Centre, Bangalore

⁴⁷ The information for Knowledge Networks have been obtained from their individual websites: Kanaja (www.kanaja.in); Nasscom Knowledge Network(<http://www.nasscomfoundation.org/programs/nasscom-knowledge-network>); KLP(www.klp.org.in), ;NKN(www.nkn.in); Solution Exchange (<http://www.solutionexchange.net.in/>); The Learning Network (www.learningnet-india.org)

- **Solution Exchange:** The Karnataka Community of Solution Exchange leverages knowledge with its Community of Practitioners to address wide range of social development issues through collective and collaborative efforts, to accelerate development of the state. The community is focussed on overall development of the state vis-à-vis Millennium Development Goals and is an initiative of United Nations in India
- **The Learning Network:** It was conceived in Bangalore, as a resource for interested groups, individuals, educators and parents seeking meaningful approaches to education. It is coordinated by a volunteer team of network members, located in India and the United States and has several participating individuals and groups. The main activities of the network include an annual conference, workshops on special topics, topic-driven mini-conferences, newsletters and an annual conference magazine.

In conclusion, methods of mass communication in Karnataka comprises of a vast range of mediums which are spread across the State. Whereas television and radio are reported to be the most used mediums at present, traditional mediums like libraries and newspapers are further expanding with increasing literacy levels. But most importantly, taking into consideration the future requirements of the State - ICTs/Internet would be the key driver for knowledge dissemination and sharing. They act as an integrating factor, bridging information asymmetry and need to be expanded both in rural and urban areas of Karnataka.

Knowledge Dissemination: A Synopsis

Strengths

- The Gross Enrolment Ratio (GER) for Karnataka is higher than the national average and in some districts primary enrolment is almost universal.
- Compared to the national average, Karnataka has a higher number of general colleges and institutions for vocational training.
- EDUSAT has already been established at VTU providing e-learning and distance learning facilities to more than 100 colleges. EDUSAT has not reached majority of States in the country yet.
- Telemedicine facilities have already been established in all district hospitals of the State. It has not yet been introduced in majority of Indian States.
- More than 90 per cent of the villages are connected through wireless network.
- Currently there are 27.69 internet subscribers in Karnataka per 1000 population and it is ahead of the national average and states like Andhra Pradesh, Tamil Nadu and Kerala. Primary survey reveals that people are open and receptive to innovation and ICTs.
- There is a vast network of NGOs in Karnataka which are contributing to the States development through active knowledge dissemination.

Weaknesses

- Lower transition rate from primary to secondary and secondary to higher education levels - only 34 per cent reach up to higher secondary and less than 10 per cent reach the graduation level.
- In case of secondary and higher levels of Education there is a gender and social disparity as the dropout rate among girls and backward sections of society seems to be comparatively higher.
- Infrastructure gap in the schools, especially with respect to RTE.
- Quality of primary and secondary education in the State needs attention, as determined by various studies including ASER 2010, NUEPA Flash Statistics, KSQAO etc.
- Seats in emerging areas like Biotechnology (in engineering colleges) have excess industrial demand for skilled labour with limited supply partly due to low proportion of government seats allocated to it.
- Shortfall in staffing at the Primary and Community Health Centres.

Key Gap Areas

- **Education:**
 - Strategy for successful implementation of RTE and measures for Quality improvement
 - Development of demand-driven curriculum including components on health nutrition, civic awareness, and agriculture for example.
 - Bridging district wise disparities in literacy
 - Computers in schools and spread of Computer Aided Learning (CAL) in schools
- **Health:**
 - Facilitation of Mass level Dissemination through ICTs in Health including Telemedicine
 - Ensuring adequate Staffing in local/community health centres and relevant monitoring
- **Agriculture:**
 - Spread of Innovative agricultural practices and related information
 - Information dissemination on areas like credit facilities, water housing, market mechanisms etc.
- **Rural Development:**
 - Encouraging more frequent and accessible IEC Strategies
 - Development and monitoring the use of libraries in villages
- **Urban Development:**
 - Cities like Mangalore, Mysore and Dharwad need to be developed, better connected and provided with ICT infrastructure so that they also attract investment and achieve global competitiveness.
- **Other Cross-cutting areas:**
 - Profiling, consolidating and integrating NGO/CSR Initiatives to provide access to basic education, health, livelihood generation facilities especially in difficult to reach areas.

Knowledge Application

The third component of the framework relates to application which is the process of transformation of knowledge into productively beneficial uses and activities.

Investment in production of new knowledge and its subsequent dissemination should accelerate both economic growth and human development through the application of knowledge. In this respect, both quantitative and qualitative aspects of knowledge applications are important. Not only should application of knowledge take place on a wide scale and should eventually enhance the socio economic patterns of the society. Core areas covered in application in the present study include:

- **Profiling Educational outcomes & Human Resources Development in Karnataka**
 - Demographic advantage
 - Educational and employment profiles of work force
 - Industry wise employment, including Village Industries
 - Entrepreneurship and Innovation
- **Development Indicators across major sectors**
 - Indicators related to Education, Health, Human Development, Poverty etc.
 - Overall performance of Karnataka compared to other states

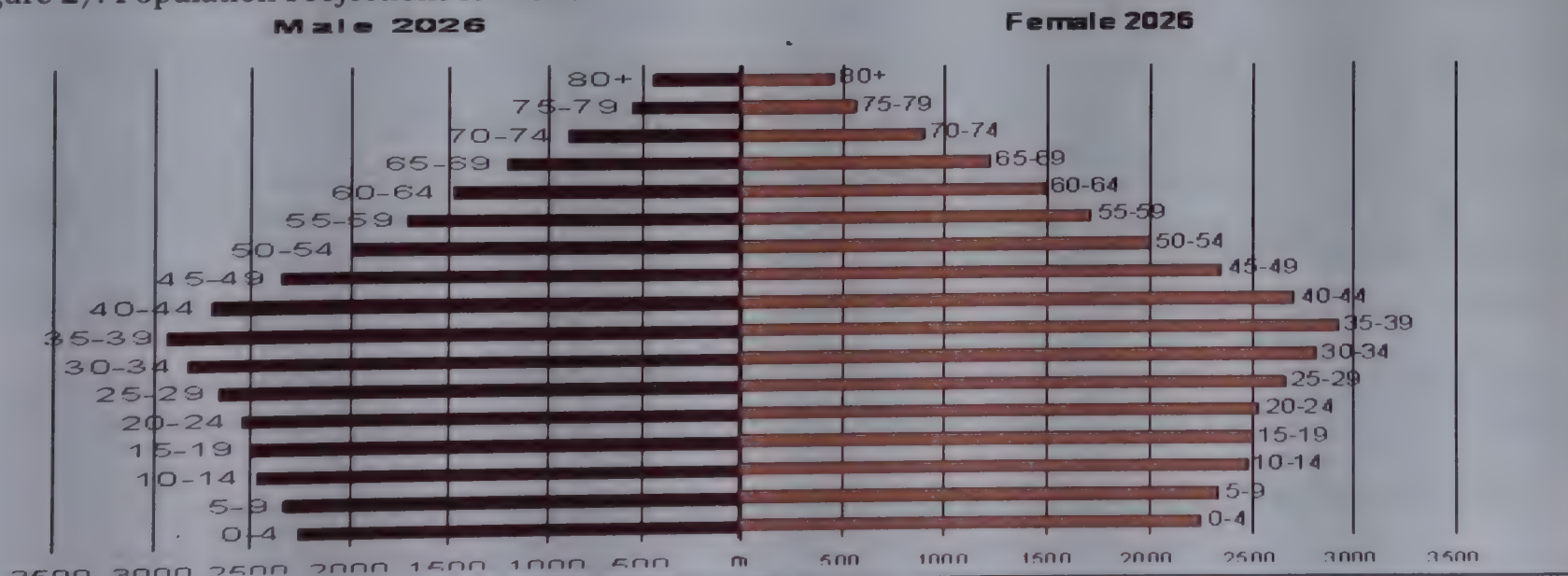
Educational Outcomes & Human Resources Development

Application of knowledge in a society is closely intertwined with its human resources. The profiles of human resources influence the effectiveness and determine how the application of knowledge would occur. In the section below we study the demographic trends, education outcomes and human resource development in the State.

Karnataka's demographic advantage

At present the majority of the State's population is up to the age of 39 years with 59 per cent in the age group of 15-59 years. The decadal population growth rate of Karnataka is 17.5%. The trend is expected to continue leading to a larger group of working age population and the projection for 2026 is illustrated below (based on Census 2011 data). The State enjoys a demographic advantage and the potential of this population can be harnessed for both creation and application of knowledge resources. In fact an appropriately trained and educated young population supported by appropriate livelihood prospects can reap huge dividends for the State. However, at present this demographic transition indicates a critical need for creating productive employment opportunities, social security and safety nets.

Figure 27: Population Projections for 2026

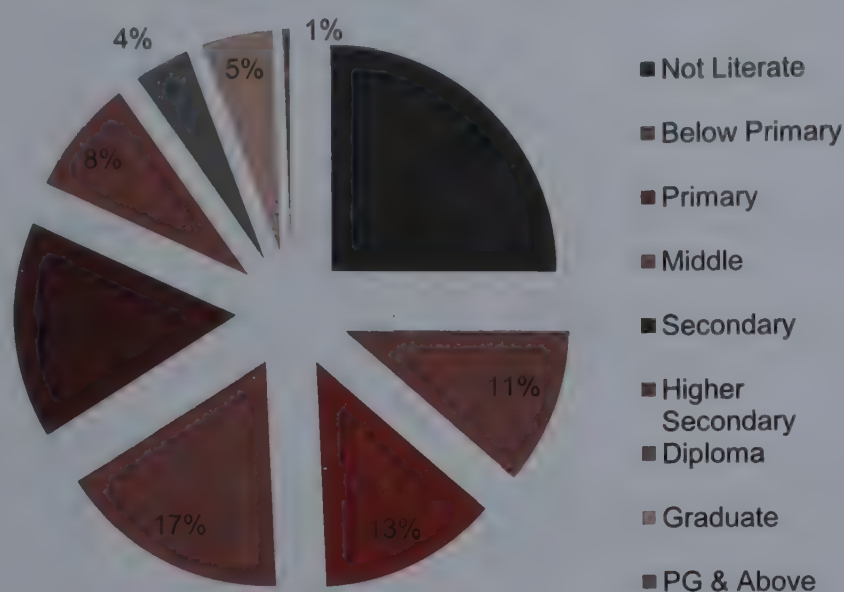


Profile of the working population in Karnataka

A large proportion of the State's working population has low education levels with 25% of work force being illiterate and 49% of work force entering the labor market without secondary education.

Figure 28: Educational Profile per 1000 distribution in Karnataka, Employment & Unemployment Survey, 2009-10, Ministry of Labor & Employment, GoI

Educational Profile (per 1000 distribution)



Education Outcomes: Education level of the rising population is one of key considerations at present. In Karnataka per thousand distributions only 4 percent of the workforce entered with a diploma, 5 percent with a graduate degree and 1 percent with a post graduate degree or above⁴⁸.

The same report depicts the condition in the rural area to be worse as compared to the urban area. The incidence of illiteracy in the rural area is almost 10 per cent higher than the urban area.

Educational profiles of Workforce Views of respondents in the Primary Survey

- 49% of the respondents had not received any formal educational training to perform their present job, 54% of which said they were self taught (52% rural and 59% urban) and 29% had learned their skills from family members (32% rural and 22% urban).
- Urban – rural analysis shows only 38% of urban respondents had received some sort of formal training, only 27% of rural respondents had received formal training. Only about 10% of respondents had undergone apprenticeship trainings for their current job.

Work force Composition: The number of job seekers measured by numbers in live register of employment exchanges decreased by 10.64 per cent between April 2009 and November 2009 alone. This indicates an increase in overall employment in the State. However, the organized sector employment during the same period increased by only 0.98 per cent. **This shows that the increase in employment in the State is skewed towards the unorganised sector which largely employs unskilled labour.**

Highlights of the Workforce in Karnataka

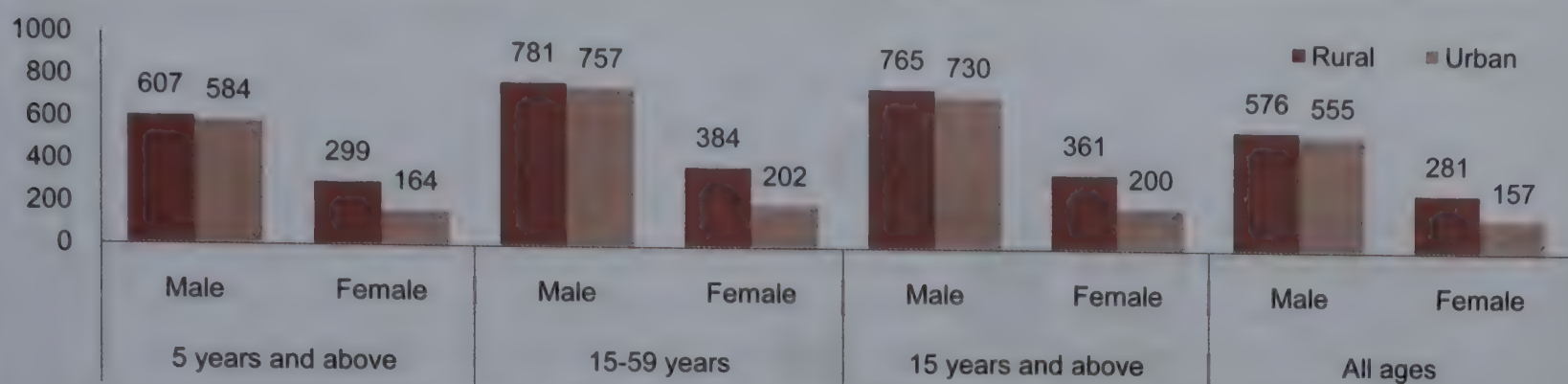
- Employment in the Organized sector:
 - Public Sector: 47% (10.54 Lakh)
 - Private Sector: 53% (12.03 Lakh)
- Salaried employees - majority in industry and IT sector
- Large proportion in unskilled labour force
- Self employed : High proportion of workforce in farming (rural) and informal sector (urban) constituting low skill base and low access to credit
- Rural – urban disparity is evident in employment trends.

(Source: Karnataka State Economic Survey, 2009-10)

⁴⁸ Report on Employment and Unemployment Survey, 2009-10, Ministry of Labor & Employment, GoI

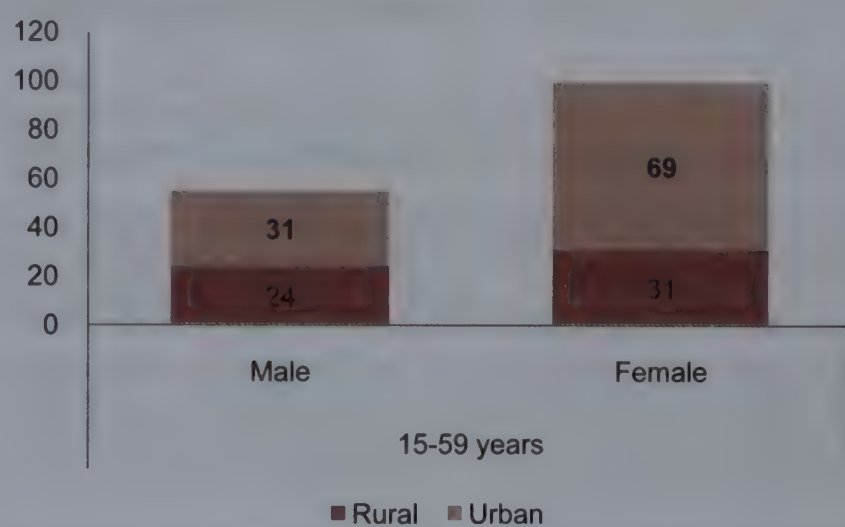
Gender wise employment: The figure below shows the worker population ratio (both male and female) per thousand populations for both rural and urban Karnataka. It clearly depicts that women participation in the workforce is much lesser than men for all age groups, with greater disparity in urban Karnataka.

Figure 29: Worker Population Ratio (WPR) per 1000 population, Employment and Unemployment Survey, 2009-10



It is interesting to note that in the working age population of 15 – 59 years, 78 per cent of the males in rural areas are working and at the same time, 38 per cent of the female members are a part of the workforce. The participation of females into the workforce is much lower in urban areas with only 20 per cent of the females being a part of workforce. It can be estimated that more than 11 Lakh women in the State are unemployed with greater incidence in urban Karnataka.⁴⁹ **There is considerable gender disparity in terms of employability that needs attention.** As a result, Skill development and employability options need to be created for women in the State to reduce the persisting unemployment.

Figure 30: Unemployment Rate (UR) by different age groups (Per 1000), Employment and Unemployment Survey, 2009-10



Industry wise employment: The major industries in the state are IT and ITeS, Biotechnology, Engineering, Electronics and Telecom, Automotive, Textile and Apparel, Agro and Food Processing, etc. Factors like natural resources, human resources, infrastructure combined with policy thrust from the state government has ensured the growth of these industries on a sustained basis. The New Industrial Policy of Karnataka (2009-14) deserves mention in this respect, aiming to build a prosperous Karnataka through development of human and natural resources in a systematic, scientific and sustainable manner.

Key missions of the New Industrial Policy (2009-14):

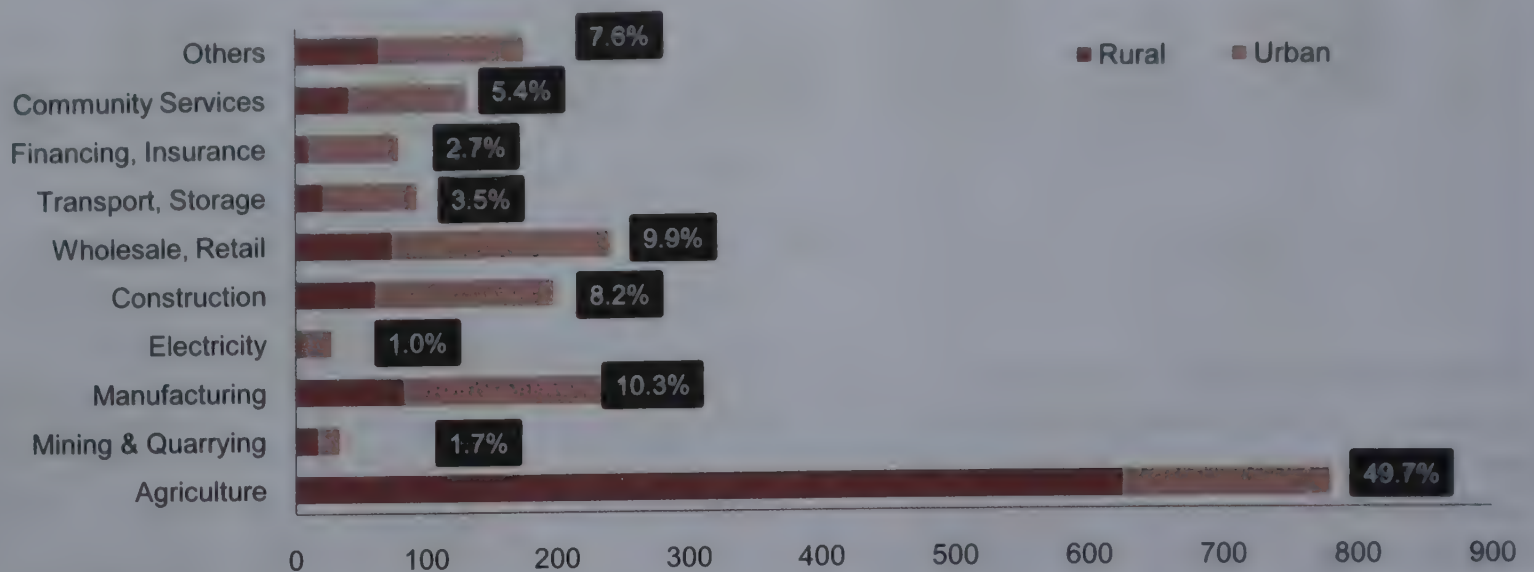
- Create an environment conducive to industrial growth.
- Ensure that industrial development is inclusive.
- Provide additional employment opportunities for 1 million people in the state by 2014.
- Increase the contribution of the manufacturing sector to GSDP from its current level of 17% to 20% by the 2014.
- Double exports of the state by 2014
- Provide high quality infrastructure throughout the state.
- Focus on skill development and entrepreneurship.
- Increase the focus on MSME sector.
- Introduce performance and employment-linked incentives and concessions

The figure below shows the distribution of persons according to their employment in broadly categorized industries. It depicts that agriculture and allied sectors employ around 50% of Karnataka's population.

⁴⁹Calculations drawn from: Employment and Unemployment survey (2009-10) which reveals the unemployment rate for women of all ages to be 39 per 1000 population and Census 2011, the female population of Karnataka is 30072926.

Manufacturing (10.3%), Wholesale/Retail (9.9%), Construction (8.2%) etc are the other main sectors generating employment in the State. Further a Rural – Urban analysis of employment statistics reveals that though agriculture is the mainstay of the rural inhabitants, financing, wholesaling, construction, manufacturing are the key industries generating employment in the urban regions.

Figure 31: Per 1000 distribution of persons in principal activity by broad industry group [Figures in black boxes indicate % of total workforce engaged]



Source: Drawn from Report on Employment and Unemployment Survey, 2009-10

Employment in Village Industries: The village or cottage industries in Karnataka mainly comprise of activities like sericulture, handicraft and handloom textile including khadi. Products like Mysore Silk, sandalwood carvings, bidriware artefact made from metal, Mysore paintings, etc. are well known. As per the KVIC Annual Report (2009-10) the Village Industry employed Rs 4.41 Lakhs in 2009-10 of the rural population of Karnataka with total production worth Rs 1295 Crore. This is highest amongst the South Indian States, contributing to around 7% of the national production.

At present, several initiatives are being taken by Government of Karnataka to promote the village industries and provide employment to rural masses through these. Some the programmes and schemes in this regard include:

- **District Industrial Centres (DIC):** established to promote cottage and small scale industries in the respective districts through participation in Handicrafts Expo's organised from time to time, promotion of transfer of Skill and Service Centres (terracotta), design development for handicraft, cane and bamboo products, wood carving, solapith work, etc. is also undertaken.
- **Vishwa programme:** It is implemented for continuous productive employment by utilizing local resources for manufacturing goods and services for mass consumption. Institutional support is provided for training, establishment of production units, support services like supply of raw-materials and marketing through District and State level Boards and Corporations.
- **Kayakanagara Programme:** This programme is based on developing a multi-craft township for traditional artisans like cobblers, bamboo workers, sheet metal and brass workers, pinjaras, tailors, etc. The State Government provides grant towards land development and construction of Living Cum Work sheds (LCWs). The minimum basic facilities like roads, water, power, play ground, community hall etc., are also being provided. Three Kayakanagara are under implementation at Naredra Village (Dharwad District), Hoovinahadagalli (Bellary) and Ramadurga (Belgaum).
- **The Karnataka State Handicraft Development Corporation (KSHDC):** The Corporation is a nodal agency for handicrafts promotion programmes in the State. KSHDC is implementing various

programmes for the development, promotion and marketing of handicrafts, procuring directly from the artisans.

- **Urban Haat:** Under the scheme, small markets are established in prime locations in the State to enable the artisans to sell their products directly to the consumers. It is planned to develop 40 to 50 stalls in the artisans' complex along with exhibition halls to cater to the requirement of artisans. This can help them sell their products through weekly exhibitions. Ministry of Textiles, GOI provides 70% of the cost of project subject to maximum of Rs. 210.00 lakhs and the remaining 30% of the project cost up to Rs. 90.00 lakhs is borne by the State Govt and implementing agencies.
- **Khadi & Village Industries Board (KVIB):** The main objective of the KVIB is to give priority for Khadi and Village Industries in rural areas. It implements several schemes for developing the sector and provides assistance for the cottage industries to generate employment opportunities to improve upon the economic status of the rural artisans. The main activities include implementation of Prime Minister Employment Generation Programme (PMEGP), product development, rebate on retail sale of khadi products, schemes like SFURTI, scheme for strengthening of weak khadi institutions, etc. The village industries include bee-keeping, herbal products, food processing, handicraft, etc. It is important to recognise the efforts undertaken under the Entrepreneurship Development Programme (EDP) through departmental, non departmental and independent training centres.
- **Karnataka State Coir Development Corporation Ltd:** The Corporation was established for developing Coir sector in the State. The main functions include developing, promoting and stabilizing the coir and coir based and coconut based industries in Karnataka, implementing scheme of the Government of Karnataka and the Government of India for the development of coir and coconut based industries, provide training and undertaking research and development of coir and allied products.

Schemes & Benefits: Department of Employment and Training undertakes training for registered job seekers in addition to vocational courses for enhancing employability. Schemes for inclusion of SC/STs and other backward sections have also been initiated. However, data analysis reveals that areas like women oriented skill development need further emphasis.

Most of these initiatives for employment generation in the Village Industries, have been undertaken by the Central or State governments with focus on provision and development of artisans. However, there is scope of promoting entrepreneurship and income generation through various collaborative and community based models. This needs to be given due attention, to revive the sector and make it self sufficient to face the future challenges.

In addition, social security of the workforce is also a rising concern with only 20 per cent of the total workforce in the state been covered by them so far⁵⁰. In fact the lowest coverage remains in areas like agriculture, mining and construction which are the high employment sectors of the State.

In conclusion, Low work participation rates and the low percentage of workers in the organised category reflect on low levels of livelihood due to lack of skill, work opportunities, rigid work structures⁵¹ etc. These factors are indicative of a low capacity base which restricts the arenas of knowledge application. Skill development, generation of employability and strengthening of inter linkages between demand and supply in the labour markets drives effective application of knowledge, propelling the desired transition to the Knowledge Society.

Entrepreneurship & Innovation

The innovation and entrepreneurship climate in a society is reflective of the attitudes towards knowledge application. Innovations are not only interlinked with entrepreneurship but are required in every sector to

⁵⁰ Economic Survey of Karnataka (2009-10)

⁵¹ Human Development Report, Gulbarga 2008

ensure a faster and smoother transition to the desired state. This study sought to assess the extent and support for entrepreneurial activities in order to evaluate this dimension. The findings from the survey along with secondary data are highlighted below.

Advantage Karnataka:

- 71% of respondents felt that recent innovations and inventions have greatly enhanced their living conditions/ increased productivity levels/ reduced costs. 73% also stated that they would participate in an experimental pilot project if a Government/ NGO/ Private entity approaches them
- Amongst the service providers, 79% felt that the State provides enough scope and freedom for innovation and entrepreneurship in their field while 80% stated that the State is taking sufficient steps to promote entrepreneurship.
- According to a recent report⁵² on Entrepreneurship in India across six states (2009), 'Karnataka provides a transparent policy framework and a supportive business environment which is designed to encourage entrepreneurship and industrialization'. The study highlights the proactive and supportive approach of the state government, particularly relating to the IT/ITES sector as well as measures to encourage entrepreneurship in rural areas, an emphasis on promoting skill development and the presence of a financial system in the state.

Areas that need development for promoting Entrepreneurship:

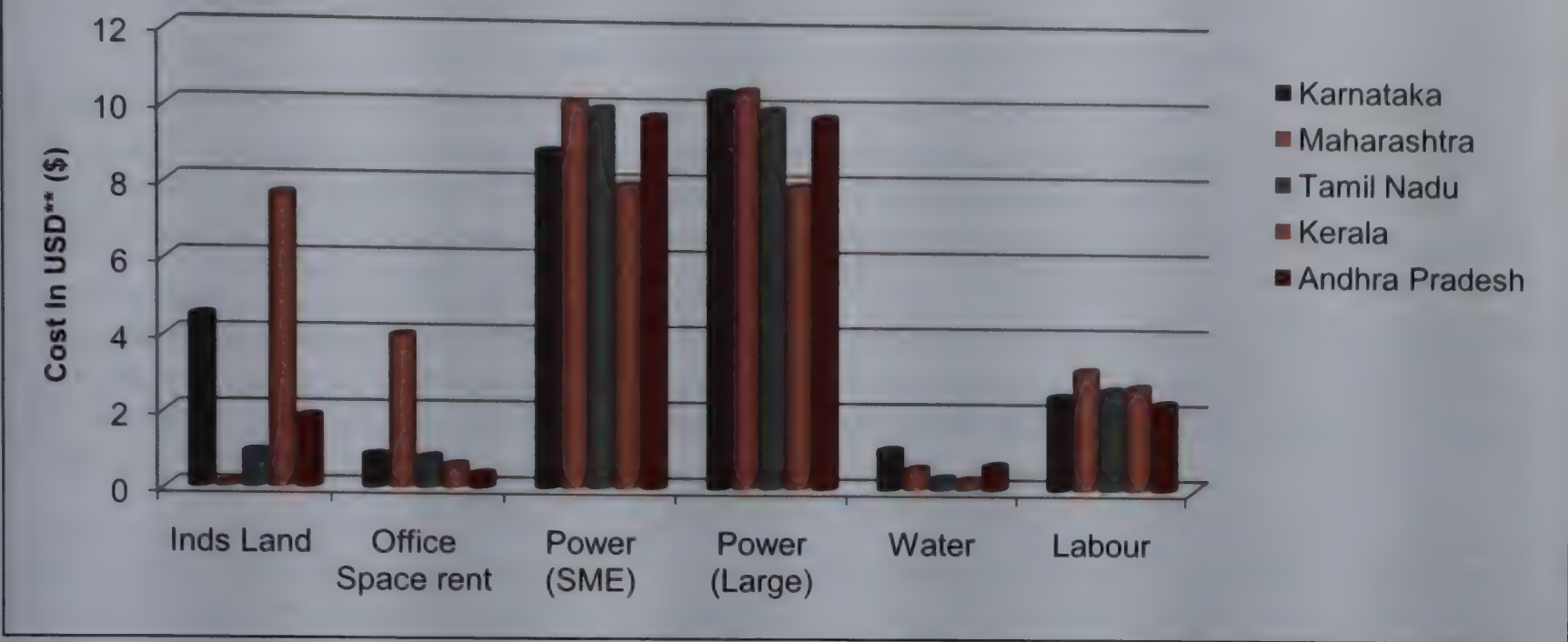
- In addition to the State's advantage the report identifies the drawbacks relating to entrepreneurship in Karnataka as:
 - Lack of basic and affordable infrastructure such as water, power and roads.
 - Insufficient state support for early stage and seed funding
 - Need for prompt resolution and clarity on land title
- Secondary data also seems to indicate that the extent of entrepreneurial activities being undertaken in Karnataka is relatively less, particularly in comparison with other states in India. In terms of Industrial Entrepreneur Memorandums (IEMs) implemented in India, Karnataka has consistently lagged behind compared to the national average. For example, in the year 2011 (up to March 2011) Karnataka has had only 5 implementations in comparison to a national aggregate of 130. The highest have been implemented in Maharashtra followed by Andhra Pradesh and Gujarat.⁵³
- Some of the main constraints to innovations/ entrepreneurial activities in the State according to researchers consulted for this study reflect the inputs from the secondary sources –
 - Institutional apathy and lack of financial support for incubation
 - Poor infrastructure including limitations of access to power facilities in rural areas
 - Lack of awareness on patents and lack of clarity on patenting procedure
 - Attitudinal hurdles with over emphasis on profits and return on investment
 - Bureaucratic hurdles and delays in obtaining approvals and sanctions
 - Insufficient motivation to innovate and diversions through service sector jobs
 - Interference by middle men

Primary survey respondents identified the main constraints to innovation and entrepreneurship in Karnataka as inadequate infrastructure (56%) and insufficient funds (55%). In this respect it is important to consider that it takes about 6 months (Stage I: Clearance of Project -40 days, and Stage II: Clearance – 3-4 months) to obtain approval for starting a new business in Karnataka. The costs of doing business especially industrial land cost/rental, electricity, water are much higher than neighbouring states (Figure 32).

⁵² Entrepreneurial India- Sculpting the Landscape, KPMG in India and TiE, 2009

⁵³ <http://www.indiastat.com/industries/18/industrialproposals/137/stats.aspx>

Figure 32: Cost of doing business in Karnataka and neighbouring states



Source: drawn from data collected from state wise IBEF Reports (www.ibef.org). **Units: Industrial land (USD/sq.ft.), Office space rent (USD/sq ft/mth), Power for SME (cents/kWh), Power for Large enterprises (cents/kWh), Water (USD/kilolitre), Labour (average minimum wage/day).

In conclusion, though the policy thrust to promote entrepreneurship and innovation in the State is high, areas that need further attention are: provision of affordable infrastructure, awareness creation on policy benefits, generating motivation among masses to undertake entrepreneurial activities etc, as pointed out by research studies and primary survey respondents.

Innovations specific to Agriculture

The status of agriculture in Karnataka is dismal with majority of the State’s population entangled in the spiral of low productivity and poverty. Primary survey respondents from the agricultural sector have displayed a skewed demand towards innovation, which can help to elevate the sector’s performance. In addition, there is also a need for applications of newly created knowledge as well as good practices. This section tries to capture the current initiatives to promote innovation in this sector, there coverage and requirements for expansion. Latest information and costs on such initiatives have been obtained from the State’s Economic Survey (2009-10).

- **Establishment of Mango Development Centre:** In order to ensure comprehensive development of Mango in the state, implementation of the project has been approved on "Establishment of Mango Development Centres" in Kolar and Chickaballapur districts at a total cost of Rs. 19.00 crore. The period of implementation of this project will be from 2008-09 to 2011-12.
- **Mechanization in Horticulture in Karnataka state:** Under Rashtriya Krishi Vikasa Yojana, this program is being implemented with a financial target of Rs. 25.00 crore for a period of 3 years from 2009-10 to 2011-12. This amount is earmarked to be implemented in 175 taluks of the state.
- **Establishment of Flower Auction Centres:** To strengthen the marketing linkages for flower crops, approval has been accorded for the implementation of the project on "Establishment of Flower Auction Centres" in Tumkur, Davanagere, Udupi, Uttara Kananda, Kodagu and Belgaum districts, at a total cost of Rs.15.00 crore for a period of 3 years from 2008-09 to 2011-12.
- **Oil Palm Development Programme:** Oil Palm Development Program is jointly sponsored by Govt. of India and Govt of Karnataka, in which the fund sharing pattern is 75:25 respectively. During 2009-2010 the program is being implemented with a total out lay of Rs.621.35 Lakh. Under this programme, the farmers are assisted with subsidy to establish the plantation in the form of inputs for the initial 4 years or pre-bearing period.

- **Development of Bio-fuel plantations:** This scheme is being implemented from the current year. In order to meet the increasing demand for fuel, to reduce effects of global warming due to fossil fuel and also to increase the usage of bio-fuel as alternative source, state government has constituted "Bio-Fuel Task Force". In the year 2009-10, a budget provision of Rs. 50.00 Lakh has been provided for raising 202 hectare of bio-fuel plantations.
- **Biotechnology Centre:** The Biotechnology Centre of the Department of Horticulture is taking up activities like germplasm conservation, tissue culture, mushroom development, production of Bio-fertilizer and Bio-pesticides, soil, water & leaf analysis, DNA finger printing, etc. During 2008-09, 7.00 lakh tissue culture plants and 1.00 lakh Medicinal and aromatic plants were produced by utilizing Rs.79.53 lakh and Rs.5.77 lakh respectively. During 2009-10, 4.5 lakh of tissue culture plants were produced.
- **Organic Farming:** State Government has given importance to promote organic farming and during the year 2008-09 a State Level Organic Farming Mission Empowered Committee has been constituted. To implement the Organic Farming Mission activities, 174 Savayava Krishikara Sanghas have been selected in 172 taluks of the State government has earmarked a sum of Rs.100 crore for the promotion of Organic Farming promotional programmes under the plan scheme for the year 2009-10.

In conclusion, though there have been efforts to promote entrepreneurship and innovation in both agriculture and industries in the State, they need to be further strengthened and expanded. Use of new agricultural inputs including seeds, fertilizers, pesticides; demonstration of innovative agricultural practices and watershed managements etc are key areas that need emphasis in the State's agriculture development initiatives.

Development Indicators across major sectors

Indicator	Karnataka Value	India Value	Best State and Value
Literacy Rate (2011)	75.6	74.04	Kerala: 93.91
Human Development Index (2006)	0.658	0.648	Kerala: 0.775
Hunger Index (2008)	23.73	23.70	Punjab: 13.63
Gini Coefficient(2004-05)	0.264	0.297	Assam: 0.197
Per Capita NSDP 2007-08 (current price Rs)	36945	33283	Haryana - 58531
Population growth rate (2001-2011)	15.67	17.64	Nagaland- -0.74 Kerala- 4.86
Child Sex Ratio (0-6 years) (2011)	943	914	Mizoram- 971
Education Development Index (2006-07)	0.680	NA	Kerala: 0.772
Life Expectancy (2005)	66.64	66.91	-
Infant Mortality Rate - IMR (2008)	45	53	Goa-10, Kerala - 12
Maternal Mortality Rate - MMR (2004-06)	213	254	Kerala - 95

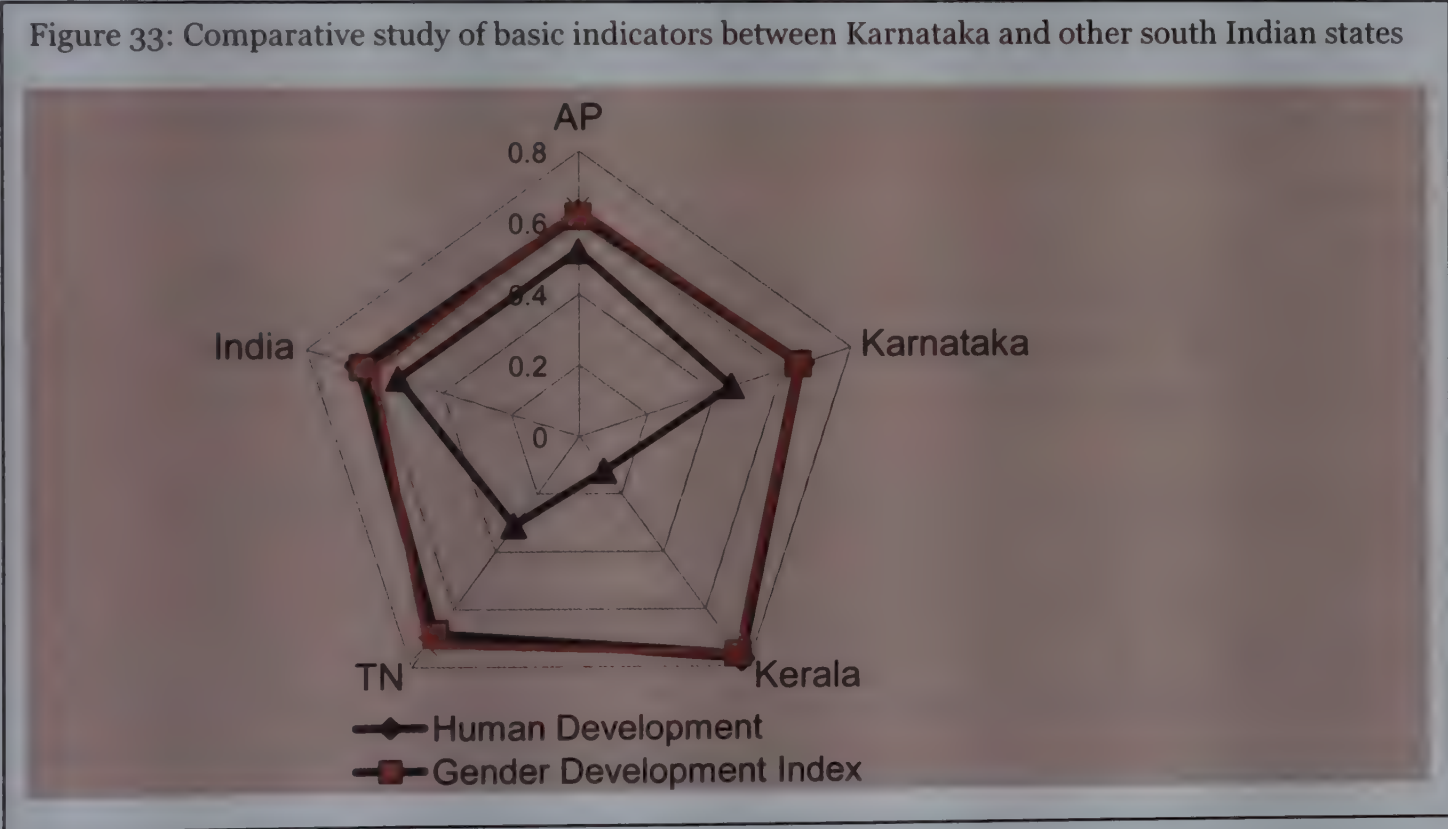
The latest available development indicators for Karnataka are listed in the table above. These indicators are reflective of the effectiveness of applications in the State in the sectors of Education, Health and overall human development. The State has fared better in terms of most parameters when compared to its previous years. At the same time when the State indicators are compared with the best state values in the country, it is indicated that there still remains a huge scope for improvement. Some key observations are:

- **Literacy Rates:** According to the 2011 Census, the State is ranked at 31st position among all the states and union territories in terms of literacy rates which has deteriorated from its ranking at 28th position in 2001. In specific it is important to note that the female literacy rates in the State have increased from 56.87 per cent in 2001 to 68.13 per cent. Thus there is need of a women focused literacy programme in Karnataka with special emphasis on the rural areas that can be integrated with the implementation of the national level Saakshar Bharat Programme.
- **Human Development:** Poverty, hunger and nutrition levels in Karnataka are reflected by the Human Development Index, Hunger Index and the Gini Coefficient. The State's performance in terms of all three

has been close to the country’s average. However it is important to note that the ranking of the State has been deteriorating in this respect. As the Economic Survey of Karnataka (2009-10) points out that the State’s rank has fallen from 9th all over India in terms of its Nutrition Index (1994) to 11th in terms of Hunger Index (2008). The incidence of poverty in the state is although lower than the national average it is much higher than states like Punjab and Assam. Focus on livelihood issues integrating the unorganized sector, mainly in rural areas needs a boost in this respect.

- **Health:** The Life Expectancy rate in Karnataka is lower than the Indian average. The State also has a high incidence of IMR and MMR as seen in the table above. In this context, knowledge on institutional delivery and better health, hygiene needs to be better disseminated and applied for improving health outcomes.
- **Education:** The EDI computed by MHRD comprises of parameters for measuring access, infrastructure, teachers and outcomes (like Gross Enrolment Ratio, Dropout rate etc.) for elementary education. The ranking of the State is 5th all over India, with relatively better performance in the areas of access and outcomes. The State lags behind in the areas of educational infrastructure and teaching quality. This reinstates our findings in the earlier chapter on Knowledge Dissemination.

Comparison with other southern states: The key indicators (i.e. HDI, GDI, IMR and EDI) are illustrated below for Karnataka and all other south Indian states, along with the national average⁵⁴. This helps to depict the relative position of Karnataka among neighbouring states and also gives a clear picture of where the state lags compared to others. A lower IMR is better for the State and in this context Tamil Nadu and Kerala perform much better than Karnataka. On the other hand a higher HDI/GDI/EDI is desirable and Karnataka yet again has a relatively poorer performance, much closer to the national average.



In conclusion, although the indicators of development in the various sectors of Karnataka are improving over years, the progress is slower in the State compared to other southern states. One of the possible reasons for the relatively poorer performance is inefficiencies in implementation of initiatives accompanied by ineffective knowledge applications. This is interlinked with ineffective dissemination and creation as well and the entire knowledge flow in the State.

⁵⁴ Human Development Index (HDI) corresponding to 2006, Gender Development Index corresponding to 2006, Infant Mortality Rate corresponding to 2008 and Education Development Index is corresponding to 2006-07.

Knowledge Application: A Synopsis

Strengths

- 67 per cent of the population in the state is in the age group of 15-59 years which establishes that the state has a favorable demographic advantage.
- The number of job seekers measured by live register figures of employment exchanges are exhibiting a decreasing trend.
- 'New Industrial Policy, 2009-14' aims to build a prosperous Karnataka through development of human and natural resources in a systematic, scientific and sustainable manner.
- Favourable policy thrust to encourage entrepreneurship and innovation, accompanied by receptiveness amongst the majority for the same (as revealed from Primary data analysis)
- Organic and sustainable farming have gained momentum in recent years.

Weaknesses

- 55 per cent of the total population is not in the labour force.
- Around 50 per cent of the workers work in the agriculture sector which contributes to only 17% of GDP.
- A large proportion of the State's working population has low education levels with 25% of work force being illiterate and 49% of work force entering the labor market without secondary education.
- Lesser participation of women in the workforce. The contrast is more severe in the urban areas compared to the rural areas.
- Constraints relating to entrepreneurship exist in the areas of insufficient state support for early stage and seed funding, lack of basic and affordable infrastructure such as water, power and roads, etc.

Key Gap Areas

- **Education:**
 - Provision of Basic Education and Literacy for majority of the working population
 - Pre employment vocational training and skill development for industry groups of manufacturing, retailing, transport, storage etc.
- **Health:**
 - Awareness on Institutional delivery for better child and maternal health outcomes
 - Nourishment of children to improve life expectancy.
- **Agriculture:**
 - Innovation in agriculture practices to improve productivity
- **Rural Development:**
 - Entrepreneurship in rural non-farm sector
 - Improvement in Human Development Indicators
- **Urban Development:**
 - Promoting equity in workforce participation
 - Poverty and unemployment in urban centres
- **Other Cross cutting Issues:**
 - Women participation in working population

Traditional Knowledge in Karnataka

Traditional knowledge refers to knowledge, innovations and practices of indigenous and local communities embodying traditional life-styles. It is the wisdom developed over many generations of holistic traditional and scientific utilization of the lands, natural resources, and environment. It is generally passed down by word of mouth and through applications from generation to generation. Organizations and scholars involved in Traditional Knowledge research are important carriers of the same and their work is leading to documentation of a largely undocumented knowledge resources. Traditional Knowledge has wide applications for human benefit especially in the present scenario where the existing resources are getting depleted and global emphasis is shifting to sustainable development. Such Knowledge is culture intense and constitutes of the following characteristics⁵⁵:

The characteristics of Traditional Knowledge:

- Skills, knowledge & practices in people
- Generally not very organized & non-formal
- Focus on culture and tradition
- Protects indigenous identity
- Present in Large numbers
- Limited investment

Institutional Access to Traditional Knowledge: Applications of Traditional Knowledge is prevalent largely in the fields of science, medicine and linguistic forms in Karnataka. The state has around 50 colleges teaching Unani and Ayurvedic medicine systems. Knowledge on languages such as Sanskrit and Kannada are also disseminated through University departments and Institutions of higher education in the State.

Documentation: However, these Institutional arrangements constitute only a small portion of the total traditional knowledge pool. A few research organisations have also been working towards identifying, assimilating and documenting Traditional Knowledge in the State and outside. For instance, the Centre for Ecological Sciences, IISc Bangalore in collaboration with several other organizations like Foundation for Revitalization of Local Health Traditions, MS Swaminathan Research Foundation, Tropical Botanical Garden and Research Institute, National Innovation Fund etc, has developed modules for recording traditional knowledge of local bio-resources in a document, called the ‘People’s Bio-diversity Register’ (PBR). Documentation of knowledge of individuals with regard to biodiversity and its use forms an important part of PBR. In the process, efforts are made to identify the persons with proven knowledge of local biodiversity, special attention is given to the elderly persons who can also provide indigenous information and focus group discussions are also conducted to collate the same. Annexure 3 of the PBR lists individuals perceived by the villagers to possess Traditional Knowledge (TK) related to biodiversity in agriculture, fisheries, and forestry.

⁵⁵ Drawn from the Knowledge Pyramid conceptualized by Dr MK Sridhar, Member Secretary and Executive Director of Karnataka Knowledge Commission.

Other Sources that Assimilate and Share Traditional Knowledge in Karnataka:

Traditional Knowledge Digital Library - A Government of India initiative to establish 'prior-art' of Indian medical knowledge systems by documenting classical herbal formulations and their therapeutic uses in a computerized form that can be searched by patent offices world-wide in order to evaluate (and reject) patent claims based on prior-art belonging to the Indian systems of medicine.

Govt. of India - CSIR, AYUSH Dept, MoEF, Ministry of Commerce - The TKDL described above & the latest amendments to patent act which disallow patents on products derived from traditional medical knowledge, and the legislation called Indian Bio Diversity Act 2002

Honey Bee Network - The Honey Bee Network is a group of individuals, innovators, farmers, scholars, academicians, policy makers, entrepreneurs and non-governmental organizations (NGOs). The Network identifies and provides a voice to creative farmers, artisans and grassroots innovators by supporting, rewarding and facilitating the protection of their work. The Honey Bee' Newsletter, the mouthpiece of the network, is published in seven Indian languages including Kannada. Acknowledging the source of the traditional knowledge, the Newsletter carries stories of local innovations with the consent of the knowledge holder.

Source: Websites of TKDL and Honey Bee Network

Major areas of Traditional Knowledge application and documentation in Karnataka:

According to the World Health Organization, up to 80% of the world's population depend on traditional medicine for its primary health needs. Combining research on Traditional Knowledge conducted by the Foundation for Revitalization of Local Health Traditions (FRLHT) and Researchers contacted during the study⁵⁶ the major areas of Traditional Knowledge study and application have been identified as follows:

Table 7: Areas of Traditional Knowledge application

Field	Examples of Traditional Knowledge Application
Nutrition	Valuation of local food resources, design of seasonal diet recipes etc.
Agriculture & Fisheries	Biodiversity, Farming methods, Weather forecasting, Seed treatment, soil quality, bio-pesticides & fertilizers, life forms in rivers and oceans and their behaviour.
Human Health	Use of flora, fauna, metals and minerals for management of common and chronic ailments and preventive healthcare
Veterinary Care	Treatment of diseases of livestock with locally available herbal resources
Handicrafts	Handicrafts Leather, textiles, metal work, pottery, fibres, jewellery
Performing Arts	Wide range of region specific folk and classical art forms
Religion & astrology	Wide range of ethnic community-based world views and practices

The table shows that Traditional Knowledge has enormous scope of application in major industries of the state especially Biotechnology. Proper collation and communication of this knowledge can lead to new avenues for Industry R&D and provide more sustainable solutions. But the large pool of Traditional Knowledge is yet to be utilized to its fullest potential and is faced with certain practical bottlenecks that need to be addressed.

Findings from Primary Survey: Survey findings on Traditional Knowledge in Karnataka have helped to identify some of the major bottlenecks in identifying and documenting traditional knowledge. The key issues raised by researchers who were interviewed include:

- Very small number of researchers are engaged in the study of Traditional Knowledge

⁵⁶ Includes response received from Dr N. Nandini, Department of Environmental Science (Bangalore University), Prof. M Jayashankara, Mangalore University.

- Traditional knowledge practitioners are scattered making collation and documentation difficult
- Practitioners of traditional knowledge are not familiar with modern documentation methods
- Lack of a proper organisational or institutional structure in place
- Lack of manpower, expertise and funding
- Lack of incentives, both traditional and career-wise

Moreover majority of the researchers (25 of the 30 interviewed) reported a lack of adequate formal mechanisms in place to identify and document traditional knowledge in the State.

Mapping of Traditional Knowledge in Karnataka: A list has been prepared (Please see Appendix V) by referring to various sources such as books from Department of Kannada and Culture and seeking inputs from experts. However, it must be observed that this is merely an indicative list of traditional forms of knowledge existing in different districts in Karnataka. The district wise prevalence of Traditional Knowledge is mapped below.

Figure 34: District wise Mapping of Traditional Knowledge



Traditional Knowledge: A Synopsis

Strengths

- A vast pool of traditional knowledge lies in agriculture, veterinary care, human health, handicrafts, performing arts, religion and astrology.
- Applications of Traditional Knowledge largely in the fields of science, medicine and linguistics form parts of academic curriculum in Karnataka and efforts have been undertaken to document it.
- Knowledge on languages such as Sanskrit and Kannada, Unani and Ayurvedic systems are also disseminated through University departments and Institutions of higher education in the State.
- Research Organisations have also been working towards identifying, assimilating and documenting Traditional Knowledge in the State and outside. For instance, the Centre for Ecological Sciences, IISc, Bangalore in collaboration with several other organizations has developed modules for recording traditional knowledge of local bio-resources in a document, called the “People’s Bio-diversity Register” (PBR).

Weaknesses

- Institutional arrangements presented constitute only a small portion of the total traditional knowledge pool given the vast pool that the state has in varied forms.
- Traditional Knowledge practitioners are scattered and not easily identifiable and that makes collation and documentation difficult.
- Documentation of knowledge of individuals with regard to biodiversity and its uses is an important part of PBR. In the process, special attention is given to the elderly persons who can also provide indigenous information and focus group discussions are also conducted to collate the same.
- Practitioners of traditional knowledge are not familiar with modern documentation methods and thus they are unable to effectively contribute to assimilation of traditional knowledge.

Key Gap Areas

- Identification and documentation of traditional knowledge
- Promoting research on Traditional Knowledge and formal institutional mechanism for sustainability

A Roadmap for Knowledge Society in Karnataka

In the above sections, a study of Knowledge Creation, Dissemination and Application is undertaken and the respective strengths, weaknesses and key gap areas (for the five sectors) have been highlighted. Addressing the gap areas serve as building blocks for the roadmap to achieve the transformation of Karnataka into a vibrant Knowledge Society.

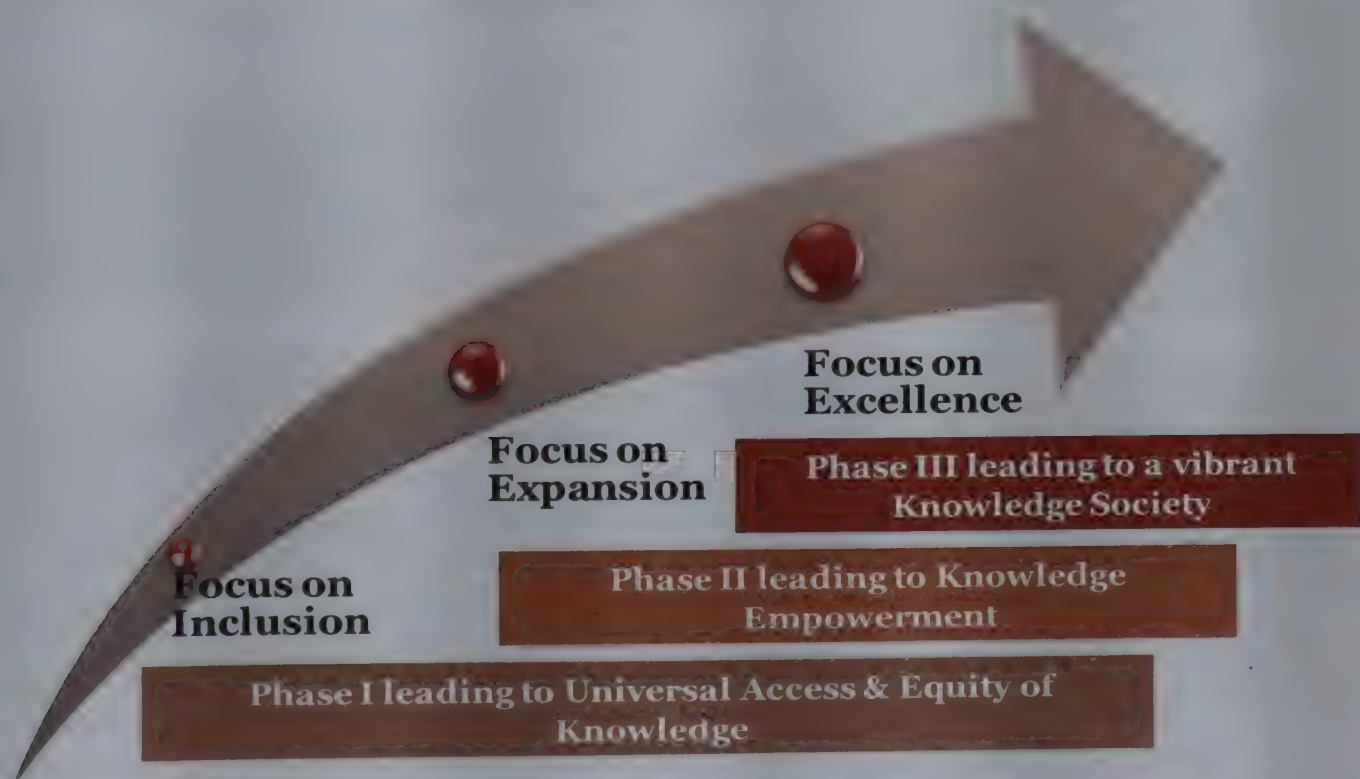
The gap analysis indicates that there exist geographical, gender and class disparities in access to knowledge. The study also reveals that small pockets of excellence in knowledge co-exist with absolute ignorance and low level of knowledge and skill amongst a large population in Karnataka. Transformation of Karnataka into a Knowledge Society would require the majority of the population achieving basic level of education with no disparities amongst them in accessing and using the knowledge as the presence of knowledge is central to theme of any Knowledge Society.

Considering the Vision 2020 as goal, we have worked on a phased roadmap for transformation of Karnataka into a Knowledge Society in the following sections.

Transition of Karnataka into a vibrant Knowledge Society

We propose the transition of Karnataka into a Knowledge Society to take place in three phases.

Figure 35: Transition of Karnataka to a vibrant Knowledge Society



Phase I –Inclusion

Social Inclusion is a multidimensional and holistic concept that not only encompasses poverty reduction but also includes income equality, quality education for all, better jobs, improved skills, health care for all, improved living conditions, etc. In other words, inclusion guarantees the basic facilities, rights and opportunities that each human being is entitled to. Therefore, in first phase of Inclusion, focus would be to achieve universal access and equity to knowledge. As many of the key indicators for inclusion are enshrined in the MDG targets, it is expected that the timelines for activities undertaken to promote inclusion would be coherent with that of attainment of MDGs.

Phase II –Expansion

Strategies on expansion, growth and development in various dimensions and sectors including education, health, agriculture, rural development, urban development need to be undertaken once basic amenities and knowledge are made available to the masses. This is an interim phase in desired transformational process and leads to knowledge empowerment. This is also the phase, where the society realises and identifies areas which provide competitive advantage and pursues them more vigorously to achieve excellence in the subsequent phase. The Expansion phase would coexist with Inclusion in areas and sectors, where significant threshold knowledge and resources already exists.

Phase III –Excellence

The Knowledge Societies have to continuously learn; excel and reinvent themselves. Therefore, Excellence is a state which cannot be bound by any timelines and areas. However, any society which aspires to reach this state has to become thought leaders and pioneers in its chosen areas. A knowledge society has to integrate sans boundaries with other societies and positively contribute to both present and future generations.

The table below summarises the outcomes expected in each of the phases for the core development sectors considered as part of this study.

Table 8: Phased Roadmap for addressing the gaps in Knowledge Creation, Dissemination & Application

Phases	Phase I: Inclusion	Phase II: Expansion	Phase III: Excellence
Strategic Direction	Immediate	Medium Term	Long Term
Education	<ul style="list-style-type: none"> Removal of geographical, gender caste and class disparities in access to education Improvement in enrolment ratios at various education levels Improvement in quality of education and learning levels Basic skill development & vocational education linked to market 	<ul style="list-style-type: none"> Research and higher Education in tune with societal needs of the State Collaboration in knowledge creation at state and national level Establish sector wise skill councils and related guidelines/frameworks 	<ul style="list-style-type: none"> Globally integrated research institutions Centres of excellence in education in chosen areas Research and sustainable knowledge creation in chosen fields of industry, science, art, culture etc.
Health	<ul style="list-style-type: none"> Equitable and affordable access to basic healthcare services Improvement in basic health and nutrition indicators of the population 	<ul style="list-style-type: none"> Developing leading institutions to take care of specific needs of – children, women, ageing population, disability, etc. Affordable access to quality health care services for critical illness 	<ul style="list-style-type: none"> Become a leading state in India for its contribution to quality healthcare, medical education and learning Achieve global levels in overall quality of health and well being of citizens
Agriculture	<ul style="list-style-type: none"> Increased growth and output per worker Introduction of Good Agriculture Practices 	<ul style="list-style-type: none"> Innovations in agriculture with focus on environmental sustainability 	<ul style="list-style-type: none"> Thought leadership in chosen areas in agriculture Creating globally acclaimed agriculture research institutions
Rural Development	<ul style="list-style-type: none"> Improved avenues for livelihood Growth and increased output per worker in Rural Non Farm Sector 	<ul style="list-style-type: none"> Livelihood diversification Promoting rural entrepreneurship Reducing urban ~ rural divide 	<ul style="list-style-type: none"> Vibrant and sustainable rural economy as a key contributor to the State's GSDP growth
Urban Development	<ul style="list-style-type: none"> Equitable access to urban infrastructure Removal of geographical 	<ul style="list-style-type: none"> Empowerment of Urban inhabitants through sustainable livelihoods 	<ul style="list-style-type: none"> Globally competitive cities with intellectual, financial, social and

disparities in
urbanisation

- and connectivity
Improved urban
infrastructure

culture capital

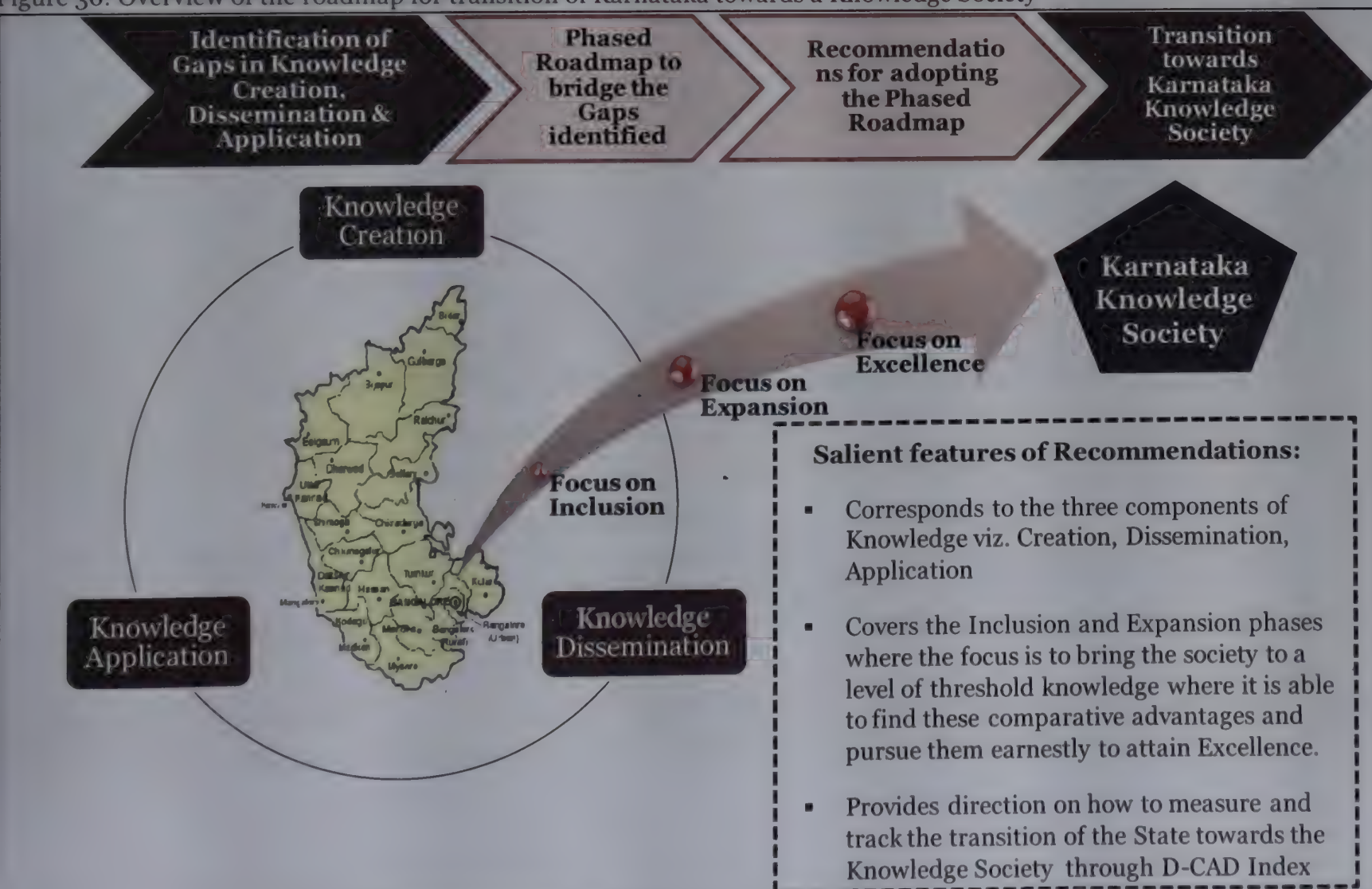
Roadmap for Transition

It is important to recognize that the State requires holistic development such that each citizen is empowered with knowledge through effective creation, dissemination and application. It is only through fostering individual knowledge capabilities that the overall knowledge capability of the state can be developed. The entire knowledge flow with simultaneous creation, dissemination and application forms the basis of our analysis and after studying each component, its strengths, weaknesses and gaps it has been possible to suggest a phased roadmap for Karnataka's transition.

Transition to a Knowledge Society would require bridging the gaps in the Knowledge Flow. While the transition is divided into three stages, due to geographical and social disparities within the state, the Inclusion and Expansion phases often coexist. These gaps can be addressed by taking a step by step approach where first the focus lies on inclusive strategies followed by policies for propelling expansion and then striving for a lifelong learning process and excellence. However while the transition is divided into three stages, due to geographical and social disparities within the state, the Inclusion and Expansion phases often coexist. The study provides specific recommendations that cover the Inclusion and Expansion phases where the focus is to bring the society to a level of threshold knowledge where it is able to find these comparative advantages and pursue them earnestly to attain Excellence.

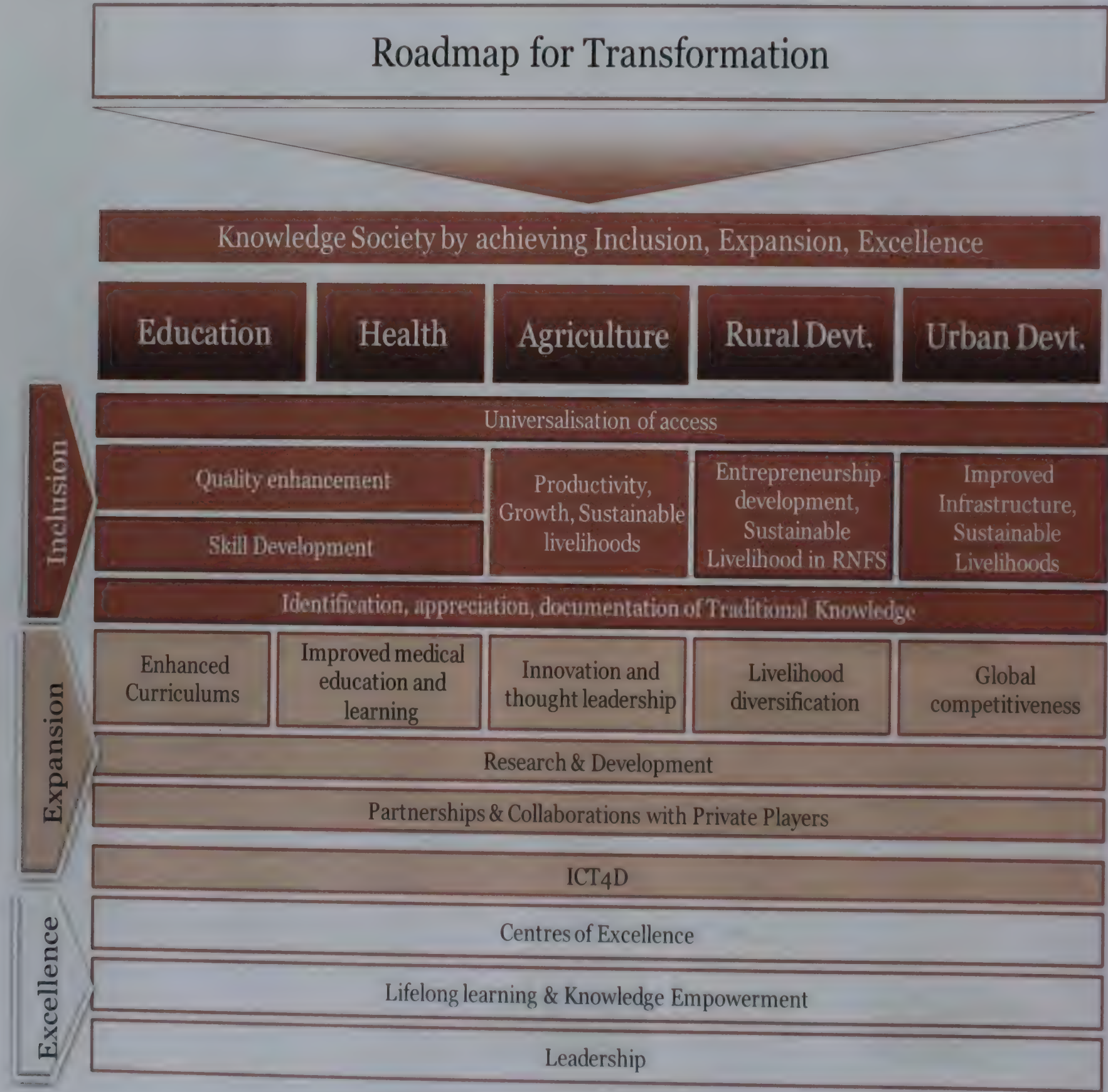
Concurrently, it is vital to measure the outcomes and monitor the progress of Karnataka's transition. An index has been proposed in the roadmap of the study to quantify the creation, dissemination and application of knowledge in the State and to subsequently measure some of the outcome indicators to continuously track where the State stands vis-a-vis its vision of transforming into a vibrant Knowledge Society. The critical aspects of the Roadmap along with the key components of the knowledge flow and transition path are illustrated as follows:

Figure 36: Overview of the roadmap for transition of Karnataka towards a Knowledge Society



Recommendations

Recommendations are provided for the five sectors separately and are largely focussed on propelling social inclusion and expansion in Karnataka. The chart for progression is formulated for the period of 2011 -2020 and leading to excellence and lifelong learning. Recommendations are derived from best practices, success stories and case studies nationally as well as globally⁵⁷ e.g. latest dialogues on quality education, example studies and experiences of World Bank initiatives, Social campaigns and success stories from India etc and cross cutting aspects like ICTs, private participation and innovation are also covered where relevant. The set of recommendations categorised based on the phases of transformation and the five sectors considered for the study is represented in the diagram below.



⁵⁷ A list of selected global best practices and success stories is provided in Appendix VI.

Education Sector Recommendations

The key imperatives to be achieved in education sector are:

- a) Universal functional education
- b) Improvement in quality of education and learning levels
- c) Link education and skill building to market requirements
- d) Channelling research into right areas and creating centres of excellence in areas of comparative advantage

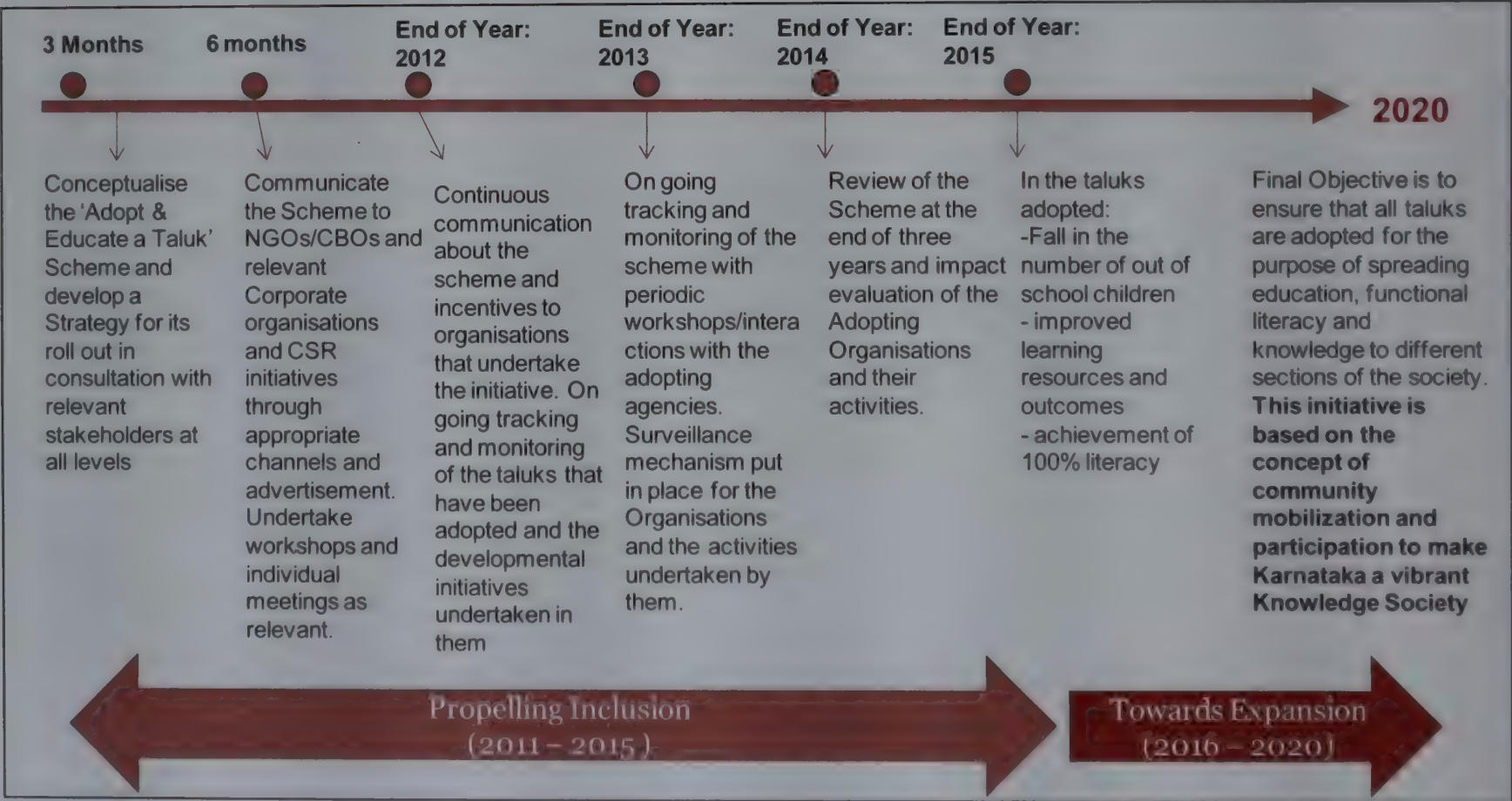
At a policy level, a number of initiatives have been already been taken at both national level and state level to achieve the above. While these initiatives have started yielding results, there is a need to accelerate the pace through greater participation of society as a whole. There is a need for new and revitalized partnerships between government and non-governmental organizations, the private sector, local communities, religious groups, and families. In this context, we suggest following specific recommendations to supplement the initiatives already being taken at various level.

Elementary education and Functional Literacy

1.1 Initiate an “Adopt and Educate a Taluk” Scheme to formally involve NGOs, CBOs and Corporate to bring “difficult to reach” children to schools and spread functional literacy

Component of Knowledge	Knowledge Dissemination
Outcome	<p>In the taluks where the scheme is implemented:</p> <ul style="list-style-type: none">No out of school childrenImproved infrastructure facilities and learning resourcesAchieving 100% functional literacy
Particulars	<p>Formally involve NGOs, CBOs and Corporate in difficult to reach areas and help in convergence of various Government schemes. The organizations can be allowed to adopt a Taluk and work on meeting the above objectives.</p> <p>The areas of participation should include:</p> <ul style="list-style-type: none">Mobilization & awareness buildingTraining of School Management CommitteesTraining of personnel of Panchayati Raj Institutions (PRIs)Curriculum and specialised support like bridge courses, reading ability etcChildren with special needsOn issues of gender, inclusion, equity etcChild friendly infrastructure and teaching learning environmentMonitoring and facilitating grievance redresses mechanism <p>Convergence and better utilisation of financial resources available from existing Government schemes should be done to run this initiative.</p> <p>All these players could be given a representation in State Advisory Committee and State Commission for Protection of Child Rights (SCPCR).</p>

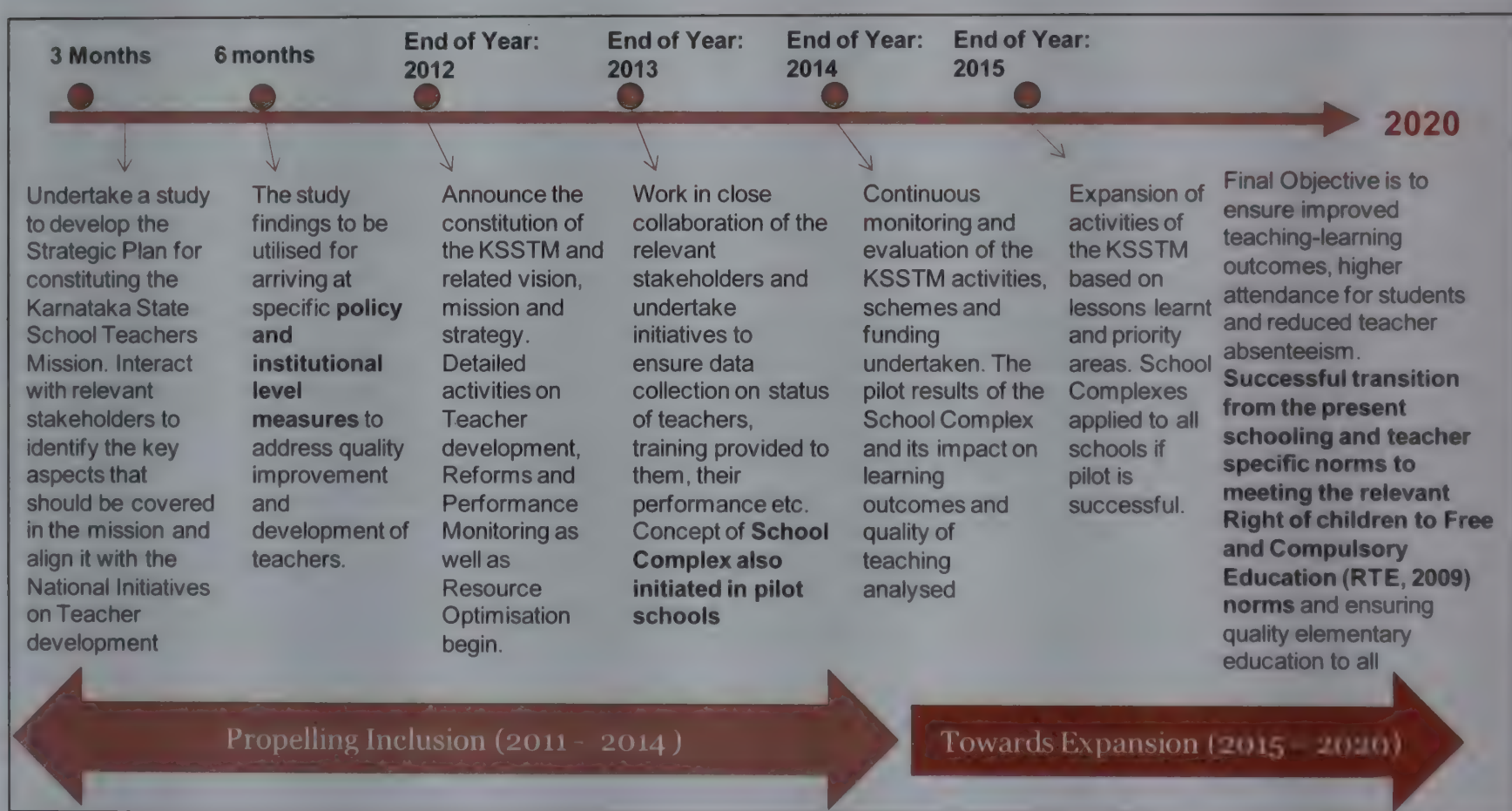
Similar Experience	<p>In India: The NGOs have for long worked to facilitate access and the right to education for all children and have partnered implementing innovative strategies to bring the difficult to reach children within the school system.</p> <p>Globally : The World Bank development initiatives, UNDP etc encourage the optimal usage of the partnerships with NGOs for fostering developmental activities in any country or state.</p>
Who?	Various Government departments involved in Elementary and Adult education along with local authorities
How much?	There are about 180 Taluks and assuming 50% of them to have lower education indicator – around 90 Taluks have to be adopted. This initiative is based on the recognition of partnerships and collaborations between Government, NGOs and Private Sector. It mainly has policy level implications and financial resources could be utilised from the existing schemes.
Indicator	<ul style="list-style-type: none">▪ Number of Taluks adopted▪ Reduction in number of Out of School children▪ Improvement in infrastructure and learning facilities in schools▪ Improvement in functional literacy
Time Phase	Phase I: 2011 -2015; Phase II: 2016 -2020



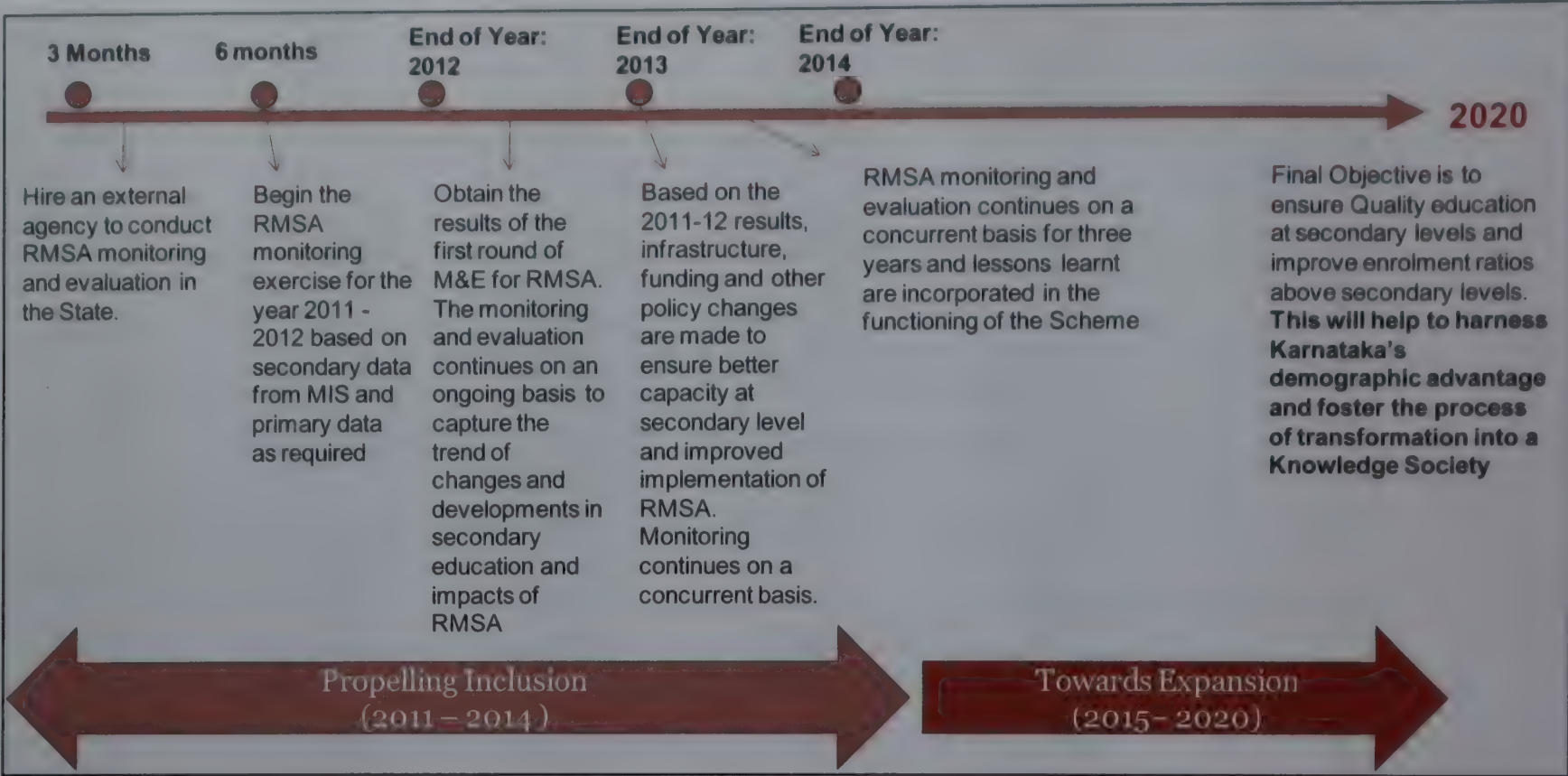
School education	
1.2 Karnataka State School Teachers' Mission (KSSTM) to be set up to look at holistic development of the teaching profession at the School level ⁵⁸	
Component of Knowledge	Knowledge Dissemination
Outcome	<ul style="list-style-type: none">▪ Improved teaching-learning outcomes▪ Improved attendance rate for students and reduced teacher absenteeism▪ Successful transition from the present schooling and teacher specific norms to meeting the relevant Right of children to Free and Compulsory Education (RTE, 2009) norms at the elementary level
Particulars	<p>Under the School Teachers Mission the following initiatives can be undertaken:</p> <ul style="list-style-type: none">▪ Teacher Development – a State level <i>Teacher Training and Development Plan</i> should be developed for attracting talent and training of existing teachers. Further, the qualification and skill requirements for the teachers with a skill development framework should be clearly laid down to ensure regular and periodic refresher trainings would be useful to keep teachers updated.▪ Performance Monitoring & Reforms - A performance tracking framework for teachers based on learning outcomes of the children should be developed to differentiate performance and identify specific training requirements for teachers. In addition under the RTE (2009), in order to counter the possible quality compromise in teaching & learning in the context of no-detention policy, it is very important to provide an institutional mechanism which could enable ensuring the required learning outcomes.▪ Coordination and Optimising Workforce utilisation – In order to ensure that the existing resources are optimally utilised, the KSSTM can undertake initiatives to promote sharing and learning in schools. For example, deriving the idea of 'School Complex' from the Kothari Commission (1964-66), we suggest an innovative formation of the school-complex which will ensure higher quality in learning outcomes. The proposed arrangement is a partnership between the teachers of a group of feeding elementary schools and teachers of the beneficiary high school within the neighbourhood. Under this arrangement, teachers of the high school under the supervision can provide subject specific guidance to the elementary school teachers and facilitate higher rate of transition of children to high school equipped with adequate learning levels. <p>The key functions to be performed by the 'School Complex' include (a) providing need-based training to the elementary school teachers within its neighbourhood, (b) carrying out on-going review of the learning levels achieved at various grades in the feeding school, and (c) conducting an annual review and assessment of the teachers of the feeding school and support the annual performance appraisal of the teachers.</p>
Similar Experience	<p>In India: The National Council for Teacher Education (NCTE) has laid down the minimum qualifications/norms for teachers to be appointed from classes I – VIII under the Right of children to Free and Compulsory Education (RTE, 2009) on 23.08.2010. It highlights the requirement of training teachers, linked to their pre existing qualifications and career development.</p> <p>Globally: The Training and Development Agency (TDA) in United Kingdom (UK) is a national agency and recognized sector body responsible for the training and development of the school workforce. The TDA receives an annual remit from the Department of Education that sets out priorities and objectives for the coming year. (Source: http://www.tda.gov.uk/)</p>
Who?	Department of Primary and Secondary Education in consultation with the Karnataka Knowledge Commission

⁵⁸ Derived from 'Catalysing growth – Education Sector in the Northern Region' – Knowledge Paper prepared by PwC for the CII eduSummit 2011.

How much?	Cost for developing a strategic plan for the KSSTM would vary between Rs 30-35 lakhs. The study findings to be utilised for arriving at specific policy and institutional measures to address quality improvement and development of teachers. This will be in line with the NCTE norms and the National Curriculum For Teachers Education (NCTE). Various initiatives suggested above under the three key areas of Teacher Development, Performance Monitoring & Reforms and Coordination can be explored in further details in terms of implementation and financial implications as a part of the study.
Indicator	<ul style="list-style-type: none"> ▪ Attendance Rate of students ▪ Rate of absenteeism of teachers ▪ Number of schools implementing the 'School complexes' ▪ Number of teachers attending training and workshops ▪ Number of peer reviews and teacher assessments through the School Complex evaluation mechanism
Time Phase	Phase I: 2011 -2014; Phase II: 2015 - 2020

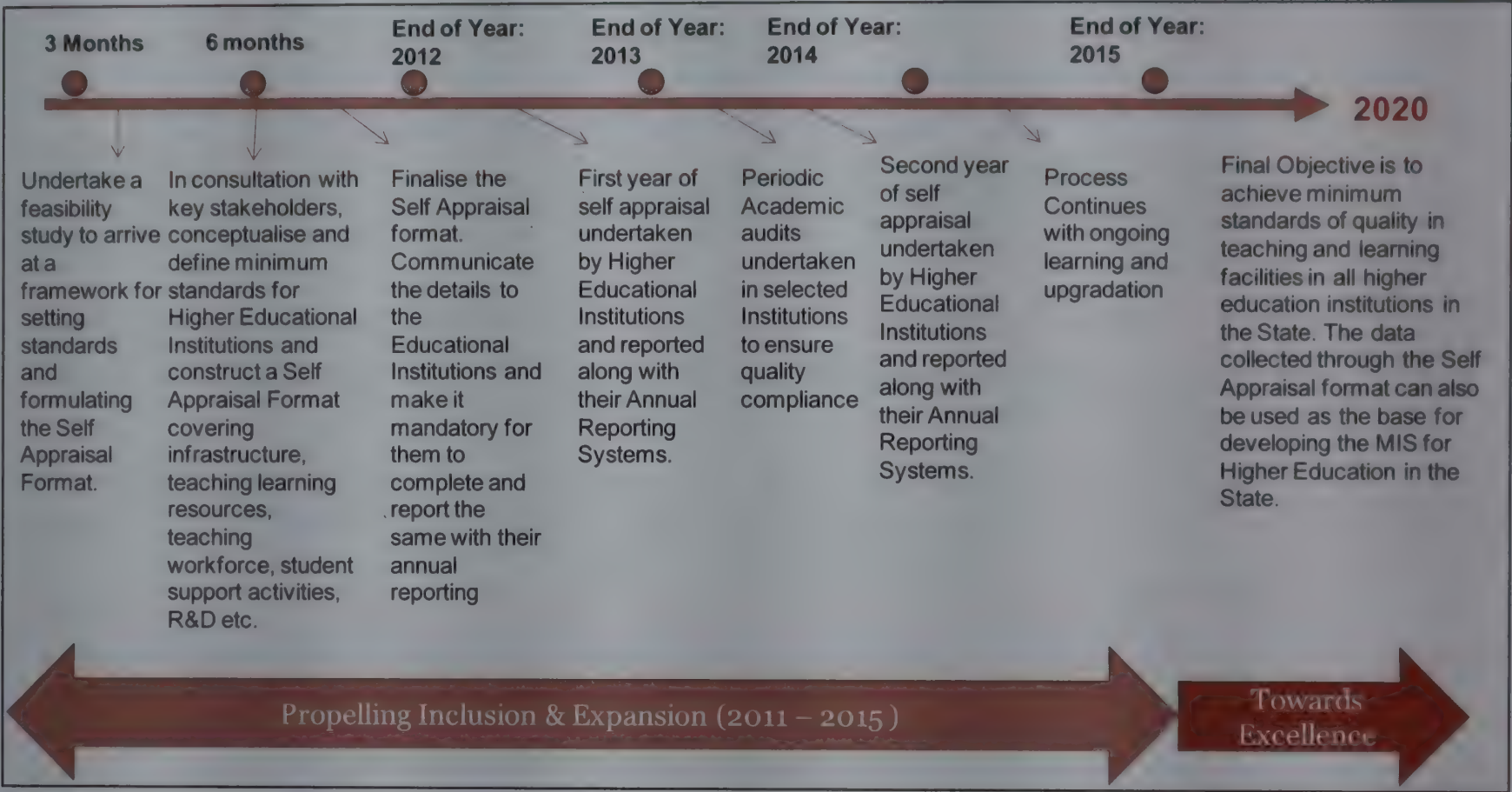


Secondary Education	
1.3 Quality improvement in secondary education through concurrent monitoring of the RMSA programme	
Component of Knowledge	Knowledge Dissemination
Outcome	Quality education at secondary levels and improve enrolment ratios above secondary levels
Particulars	<ul style="list-style-type: none">A regular and ongoing RMSA monitoring and evaluation study to be conducted by a selected external agency in order to monitor learning outcomes. The study can be conducted at the state level based on the guidelines set out by NCERT for the same.The concurrent evaluation would be done based on secondary data collected through the MIS systems and primary data collected where required.Specific areas of curriculum evaluation may include knowledge on local issues, culture, civic awareness, health and nutrition, hygiene and environment issues apart from the core academic subjectsThe monitoring and evaluation study should assess the actual status vis-à-vis set milestones for key parameters in the areas of:<ul style="list-style-type: none"><i>Access and equity</i> [school infrastructure, enrolment, teaching learning facilities etc.]<i>Quality and efficiency</i> [retentions and drop outs, learning outcomes and achievements, curricula etc]<i>Management and governance</i> [School managements, teacher recruitment and training, performance management, roles and responsibilities etc]<i>Fund utilization</i> [financial allocations and expenditures, percentage utilization, areas of utilization etc]
Similar Experience	<p>In India:</p> <ul style="list-style-type: none">The monitoring and evaluation of educational schemes is conducted at Central and State levels by National Center for Education Research and Training (NCERT) and specific guidelines have been suggested for national and state level monitoring and evaluation of RMSA <p>Globally:</p> <ul style="list-style-type: none">Evaluation of educational schemes are initiated/funded by organizations like UNESCO, World Bank, UNICEF etc.
Who?	Department of Primary and Secondary Education, Directorate of State Education Research & Training (DSERT)
How much?	Cost for a concurrent monitoring and evaluation study would vary between Rs 10 - 15 lakhs annually and could be initially undertaken for a period of three years (2011 -2014). The study findings to be utilised for arriving at specific policy and institutional measures to address overall improvement for the scheme and its impacts on secondary education in the State.
Indicator	<ul style="list-style-type: none">Improved minimum attainment level vis-à-vis [Goal≈ 80% attainment level according to Vision 2020]Increase in the retention at secondary level of education along with a reduction of Out of School ChildrenIncrease in the age appropriate enrolment at secondary and higher secondary levelsImprovement in infrastructure and learning facilities in schools
Time Phase	Evaluation can be started at the third year of RMSA implementation Phase I: 2011 -2014; Phase II: 2015 -2020



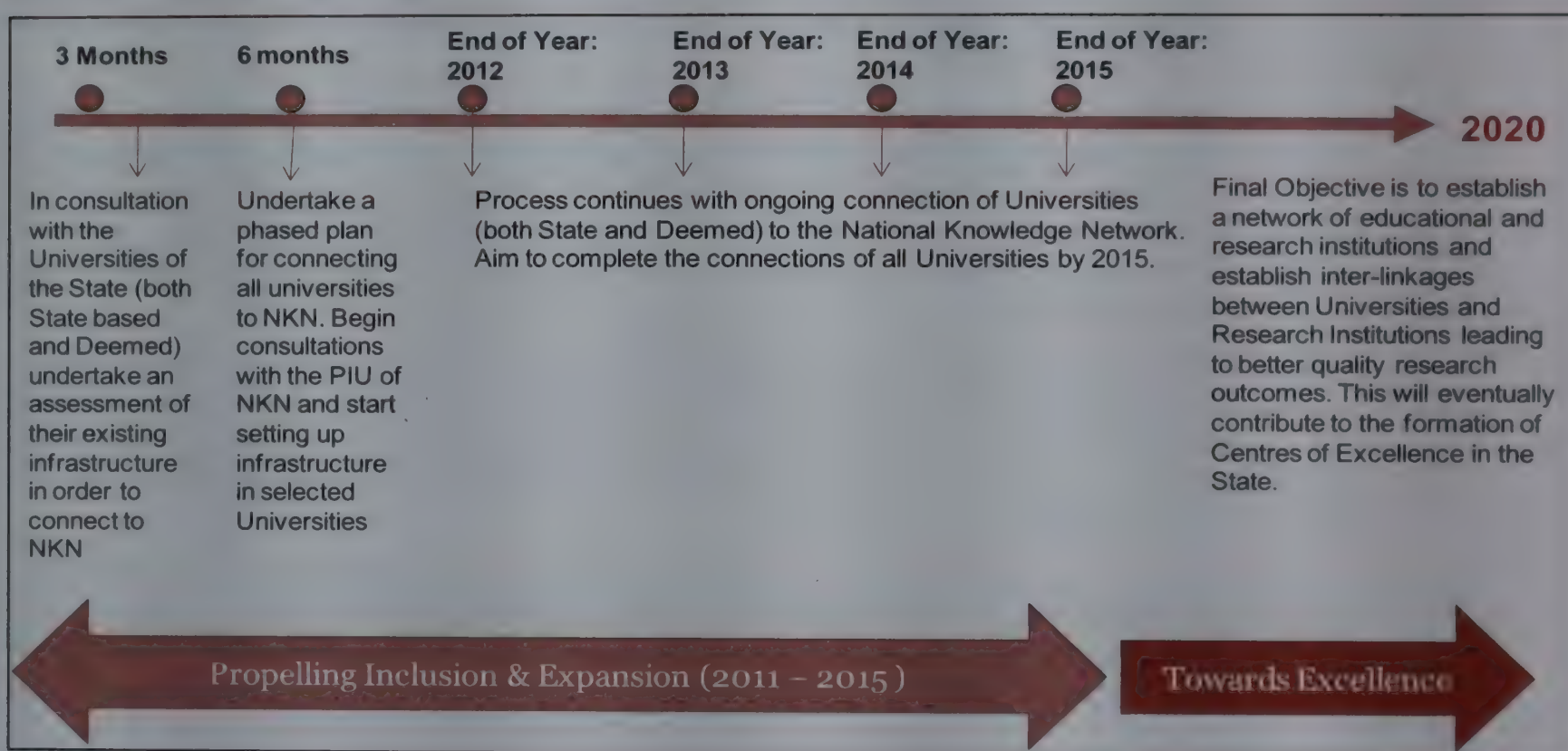
Higher Education	
1.4 Set minimum standards and develop a 'Self Appraisal Format' and reporting mechanism for higher educational institutions to enable quality enhancement	
Component of Knowledge	Knowledge Dissemination
Outcome	Achieve minimum standards of quality in teaching and learning facilities in all higher education institutions in the State.
Particulars	<ul style="list-style-type: none">▪ A Self appraisal format covering the below stated aspects in addition to basic standards should be formulated and its completion and submission should be made mandatory for all higher educational institutions as a part of their annual reporting. These aspects should include:<ul style="list-style-type: none">○ Teaching learning resources including class room facilities and digital equipments where required (ex. Science labs etc),○ Status of the Teaching workforce and their training and development needs○ Methodologies for examinations and student appraisals,○ Student support facilities covering hostel infrastructure, career consultation services etc.○ Research activities in the institutions and collaboration with other similar institutes▪ This disclosure can be reaffirmed through periodic academic audits, conducted on select institutions to ensure overall quality compliance.▪ This will keep the government abreast with development and help to identify and prepare the better performing institutions to meet greater research and development challenges in order to develop them as Centres of Excellence.
Similar Experience	<p>In India:</p> <ul style="list-style-type: none">▪ UGC conducts co-ordination and maintenance of standards of university education. It provides for minimum standards to be met by Higher Education Departments on: pay scales of faculty, age of superannuation, recruitment and qualifications, career progression for staff, selection procedures for students, curriculum etc.▪ NAAC's accreditations are offered on a voluntary basis to those Institutions that apply for it. NAAC's accreditations are considered to be prestigious and require meeting high standards in Education delivery.▪ Apart from the above, AICTE and sector specific bodies like Medical Council of India have their own set of education related standards. <p>Globally:</p> <ul style="list-style-type: none">▪ Minimum standards for Higher Education have been a part of global dialogue for the past few years. UK Study, Securing a Sustainable Future for Higher Education (October 12, 2010) by Lord Browne stated: 'Quality in Higher Education can be obtained through – setting and enforcing minimum quality levels across the sector'▪ Referring to Australian Federal Governments plans for having mandatory standards for Higher Education, it was stated 'that the mandatory standards would set minimum outcomes for knowledge and skills and universities would be free to exceed them in terms of the learning outcomes and abilities they will require from graduates.' (Please see Appendix VII for details)
Who?	Department of Higher Education in consultation with Karnataka Knowledge Commission.
How much?	<ul style="list-style-type: none">▪ Undertake a feasibility study in various higher education areas to arrive at a framework for setting standards and formulating the self appraisal format. The study should also look at available national and international benchmarks.

	<ul style="list-style-type: none">Costs for such a study would vary between Rs 35- 40 lakhs. An identified agency may be designated as nodal agency in the State to lead this initiative. The State may budget and provide certain incentive in the form of grants to institutions meeting certain guidelines and parameters.Recurring costs of collating the Self appraisal formats and conducting periodic audits would be incurred and would be subject to the periodicity and specific number of institutions.
Indicator	The percentage of Higher Education Institutions conforming to set minimum standards vis – a-vis [Goal≈ 100]
Time Phase	Phase I & II: 2011-2015



ICT in Higher Education	
1.5 Connect all Universities in the State to the National Knowledge Network	
Component of Knowledge	Knowledge Creation and Knowledge Dissemination
Outcome	Inter-linkages between Universities and Research Institutions leading to better quality research outcomes. This will eventually contribute to the formation of Centres of Excellence in the State.
Particulars	<p>Inter-linkages between various key players covering industry, academia and grass root level users is a major area that requires improvement and the following steps can be undertaken to foster that:</p> <ul style="list-style-type: none">▪ Transition to a knowledge society is characterized by collaborations and sharing of knowledge. Since, education and research activities today have become multi-disciplinary and are moving onto collaborative mode amongst faculty and researchers spread across countries. The state should leverage on the GoI eleventh five year mission (National Knowledge Network, www.nkn.in) to create a State based Knowledge Network of all universities (both state universities and deemed universities)▪ In order to ensure rapid access to reputable journals, citation index and international e-databases, the Department of Higher Education should provide grants to university to subscribe to databases and networks available in the various libraries across the state and also invest in connecting together all universities, libraries, laboratories and agricultural institutions so that the investment can be minimal;▪ There could be a facility to expose students early to research projects while they pursue graduate education. Students at the under-graduate/ graduate level should be exposed to short research projects. As part of the graduate curriculum, students can be given the option of taking a research project under the guidance of a faculty member in lieu of a course.▪ State can take up formation of research clusters and create borderless platforms which can promote and encourage multi-disciplinary research and to remove all impediments in order to increase collaboration/cooperation among researchers. This could trigger multi-disciplinary post-graduate research and innovative research outputs. In order to nurture research clusters and promote collaborative research, each University can create Research Dean positions for the popular areas of research (life sciences, health and biomedicine, science and technology);▪ Universities with support from State should collaborate with external agencies, both local and abroad to ensure networking and greater collaboration between university and industry. The State should maintain a database of ongoing and completed research in the state not only within the educational system but in the private sector and government domains as well.
Similar Experience	<p>In India: Research plays a critical role in economies that value knowledge creation and innovation. The importance of research in higher education was emphasized by the Taskforce on Higher Education 2004 which identified ‘generating knowledge’ as a key objective of higher education. Also, the NAAC in its assessment of institutions gives 15% weight age to research, consultancy and extensions in rating institutions. Our survey respondents also reported that the extent of research in the State can be further expanded through greater inter-linkages and networks between the key players.</p> <p>In Karnataka, at present only 2 universities are connected to the National Knowledge Network viz. Tumkur University (Bangalore) and Kuvempu University (Shimoga).</p>
Who?	Karnataka Knowledge Commission in collaboration with Department of Higher Education, Department of Science & Technology and National Knowledge Network (Programme

How much?	<p>Implementation Unit)</p> <ul style="list-style-type: none"> ▪ The participating institutions can directly or through distribution layer connect to the National Knowledge Network at speeds of 100 Mbps /1 Gbps, as per the NKN website. ▪ The cost of connecting the different state universities would vary depending upon the infrastructure requirements and funding available from the central government. ▪ Recurring costs for the Knowledge Network and other collaborative exercises would depend upon the scale and expanse of initiatives undertaken.
Indicator	<ul style="list-style-type: none"> ▪ Number of universities connected through the knowledge network ▪ Number of articles published in national and international journals ▪ Number of libraries with access to e-databases ▪ Students participation in research projects
Time Phase	Phase I & II: 2011 -2015

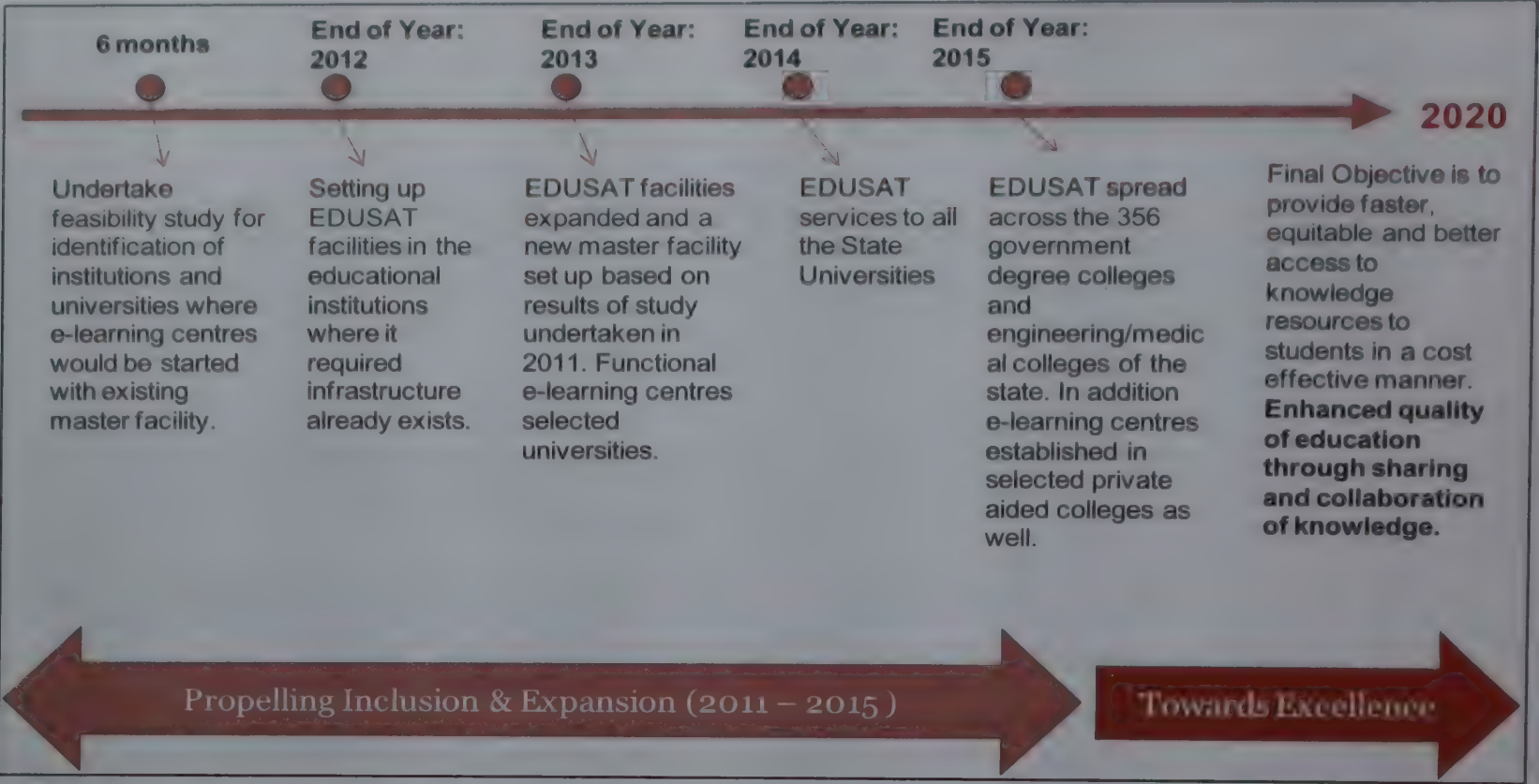


ICT in Higher Education

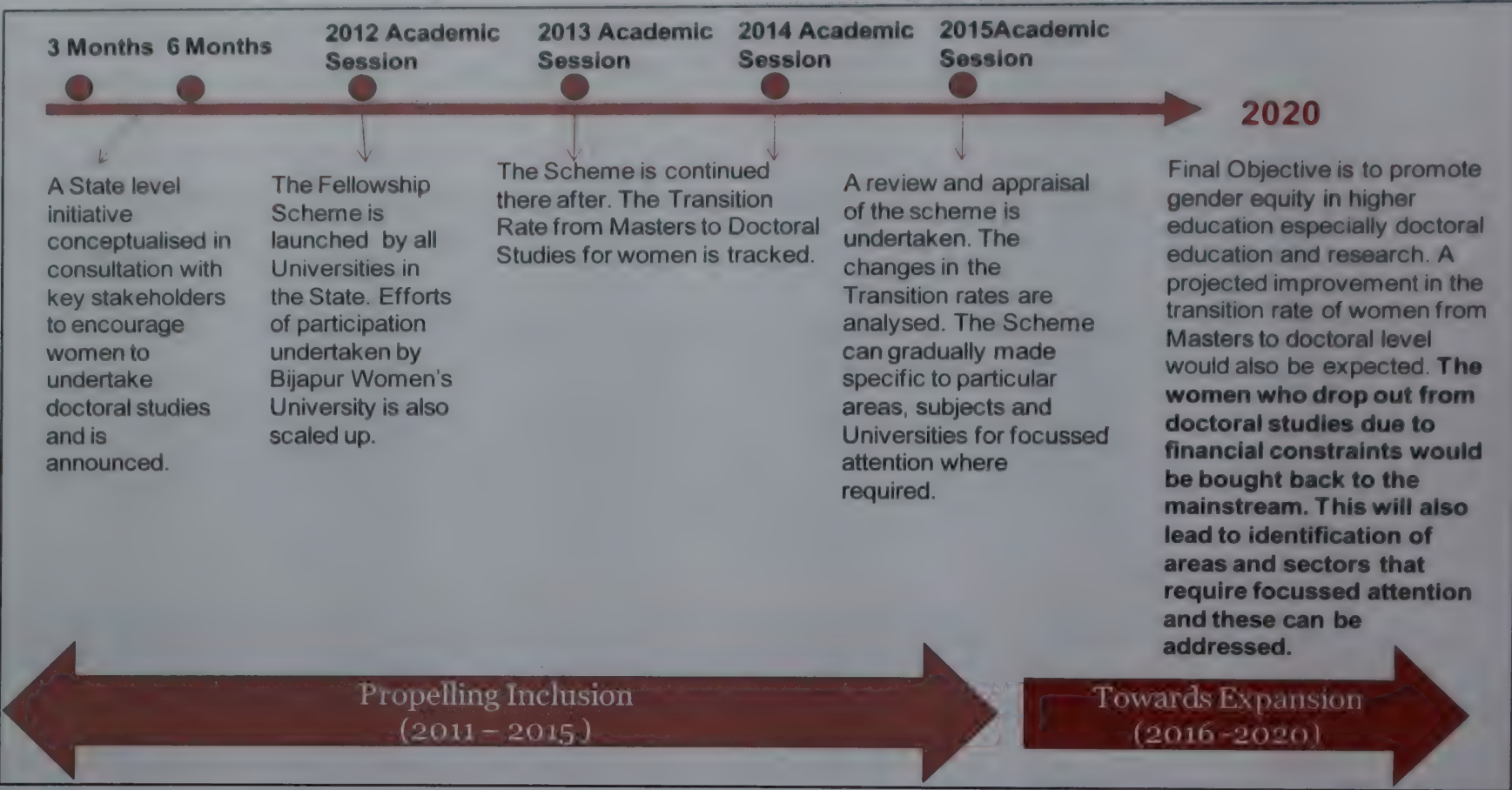
1.6 Strengthen and expand the reach of EDUSAT for Higher Education

Component of Knowledge	Knowledge Dissemination
Outcome	Providing faster, equitable and better access to knowledge resources cost effectively. Enhanced quality of education through sharing and collaboration of knowledge.
Particulars	<ul style="list-style-type: none">EDUSAT, an initiative by ISRO is operational in more than 100 colleges in the State facilitating e-Learning. Visvesvaraya Technological University (VTU) has already adopted the same.This technology can be further expanded to cover Higher Education Institutions-colleges and universities to disseminate knowledge of various developments in educational content and pedagogy. The target should be to cover all the universities in the first phase and then all the colleges of the state in the later phase.This can be very useful especially in case of medical and engineering disciplines. Some colleges have received this facility but there is scope for expansion such that benefits from this technology can be disseminated on a large scale.It will lead to the establishment of a better network in the education system of the state as e-learning also facilitates e-discussion forums among the students and faculty members of the participating colleges/institutes.
Similar Experience	<p>In India:</p> <ul style="list-style-type: none">Karnataka itself has one of the first successful EDUSAT programs in the country with VTU running the e-learning programs in more than 100 colleges. Other states like Kerala and Himachal Pradesh have also successfully launched e-learning programs. <p>Globally:</p> <ul style="list-style-type: none">'Television Educativa de Mexico' is one of the most successful e-learning programs in the world using education satellites started in 1964 only in Mexico.
Who?	Department of Higher Education in collaboration with ISRO
How much?	<ul style="list-style-type: none">One time cost of development and establishment of EDUSAT equipments and facilities for one institution would be in the range of Rs. 13 -15 lakhs.⁵⁹Costs of running and maintaining systems would be in the range of Rs. 4 lakhs paIn addition to above, there are separate costs if a master facility is set up which costs approximately Rs. 350 lakhs with Rs. 200 lakhs as recurring cost per annum. One master facility is already established at VTU in Karnataka in Higher Education.
Indicator	<ul style="list-style-type: none">Number of EDUSAT enabled e-learning centres started and functional.Increase in learning outcomes as indicated by examinations.Increase in e-discussion/collaboration forums across disciplines with participation from institutions across the state.
Time Phase	Phase I & II: 2011-2015

⁵⁹ Estimates are drawn from the proposal of EDUSAT Task Force, Government of Kerala in January, 2005.



Doctoral Education	
1.7 Introduce Fellowships for incentivising and promoting women researchers	
Component of Knowledge	Knowledge Creation
Outcome	Gender equity in higher education especially doctoral education and research
Particulars	<p>Incentives to increase participation of women in higher education and research initiatives. Following measures to be considered:</p> <ul style="list-style-type: none">▪ Earmark funds for women in postgraduate and doctoral education. The funding scheme should be applicable to all women researchers.▪ The Bijapur Women’s University should scale-up their activities based on such additional support. A percentage of the funding received should be earmarked towards incentivising doctoral studies through merit based scholarships to retain existing PG Students and attract new students to doctoral studies.
Similar Experience	<p>In India:</p> <ul style="list-style-type: none">▪ Fellowships are usually offered by most Universities and Higher Educational Institutions to selected students. UGC offers Junior Research Fellowships and Post Doctoral Fellowships which is specific to women students.▪ Department of Science and Technology, offers scholarship to women researchers and scientists between age 30-50 to help them return to mainstream science and work as bench-level scientists.▪ Efforts to encourage women in doctoral research are limited and gender based differences are still prevalent in doctoral education in Karnataka, as seen in the sections above.▪ This can be addressed through State level initiatives and funding to encourage women. <p>Globally:</p> <ul style="list-style-type: none">▪ Gender implications on higher education are observed globally. As one of the best practices scholarships are offered to women and minorities to encourage participation in higher studies and research
Who?	Department of Higher Education
How much?	<p>Fellowships for women researchers @ Rs 10,000 per month could be considered for promoting greater participation of women in doctoral education. The overall budget could be based on the number of candidates to be covered under the scheme.</p> <p>For example if the scheme is made applicable to 100 candidates in a year the cost to the government would be Rs 1.2 crore per year.</p> <p>Apart from monetary incentives, discounted fee, stay arrangement, student amenities, etc. could also be considered for encouraging enrolment of women in these programs. In case of limited fund availability, a selection method needs to be defined for identifying the beneficiaries.</p>
Indicator	<ul style="list-style-type: none">▪ Increase in enrolment of women in post-graduate courses and PhDs▪ Transition Rate of women from post graduation stage to PhD
Time Phase	Phase I: 2011 -2015; Phase II: 2016 -2020



Demand driven Skill Development

1.8 Undertake a Skill gap assessment study to identify the needs of skill development in the key sectors of Karnataka and to enable the constitution of Sector specific Skill Development Councils.

Component of Knowledge
Outcome
Particulars
Why?

Knowledge Application

For converting the demographic advantage of the State into dividends, develop adequate supply of workforce with requisite skill sets for the industries and thereby enhance capacities for better livelihoods

Karnataka has a demographic advantage with majority of its population between 15-59 years. Given the current trend of employment generation and skills required, skill trainings for increasing employability are necessary particularly for youth from underprivileged background.

Identify the skill gaps at each of the key sectors and levels through a **Skill Gap Assessment Study – in order to formulate a long term skill development strategy for the youths in different sectors to create employability. The key objectives of the study would be to:**

- Identify core industries in core sectors through secondary and primary data analysis [including reference from current initiatives of KVTSDC, Karnataka Skill Policy, Modular Employable Skills (MES) courses and syllabi etc]
- Analyse the current employment patterns in the selected industries
- Forecast and project the employment potentials of the selected industries
- Map current and projected skill requirements of the selected industries
- Strategy for setting up Sector specific skill development councils and the specific interventions that can be undertaken by relevant stakeholders

Priority sectors can be selected if they are growth oriented, have potential to absorb skilled labour and scope for micro-enterprises development. Some indicative sectors in the context of Karnataka are listed below (The number of sectors can be further expanded based stakeholder discussions and analysis of the already existing sector wise curricula developed in the State in consultation with NCVT).

- Automobiles
- Apparel
- Rural Non-farm Sector Enterprises
- ICTs
- Retailing ITeS
- Hospitality

Develop Sector specific ‘Skill Development Councils’ for the sectors identified by the Skill Gap Assessment study. **The Skill Development Councils would fulfil the following functions:**

- a. Develop a sector skill development plan, course curricula, training programmes and training manuals accordingly.
- b. Setting up MIS to assist planning and delivery of training
- c. Participation in affiliation, accreditation, standardisation
- d. Plan and execute training of trainers
- e. Promotion of academies of excellence
- f. Carry out research to identify future requirement in training and skill enhancement.

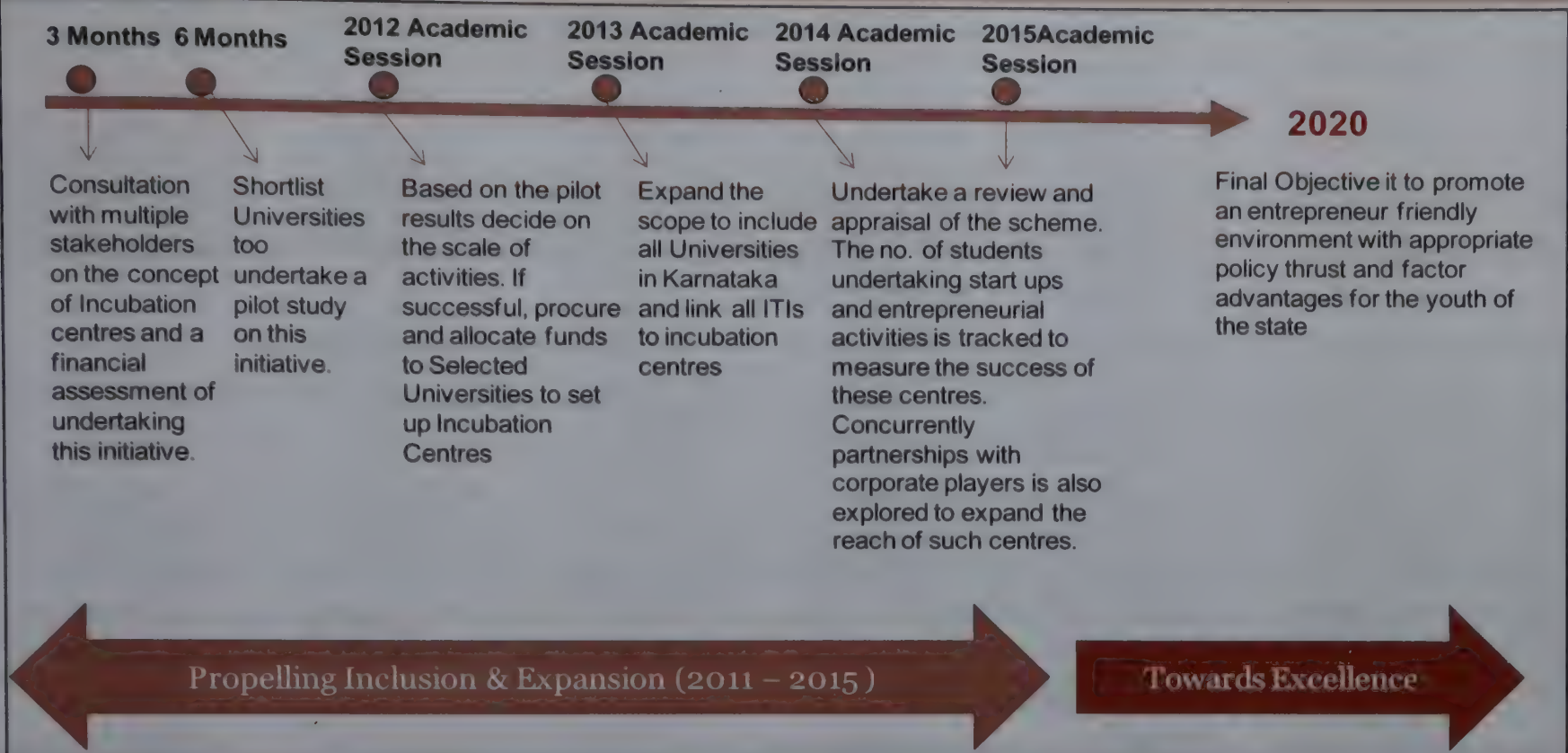
These activities can be done in partnerships with Academic Institutions, Corporate players and Industrial Training Institutes. **Moreover linkages can be established with the National level Sector Skill Councils constituted by National Skill Development Corporation (NSDC) (www.nsdcindia.org)**

In India: The National Skill Development Policy (2009) mandates that NSDC would constitute Sector Skill Councils (SSCs). SSCs are national partnership organizations that bring together all the stakeholders – industry, labour and the academia, for the common

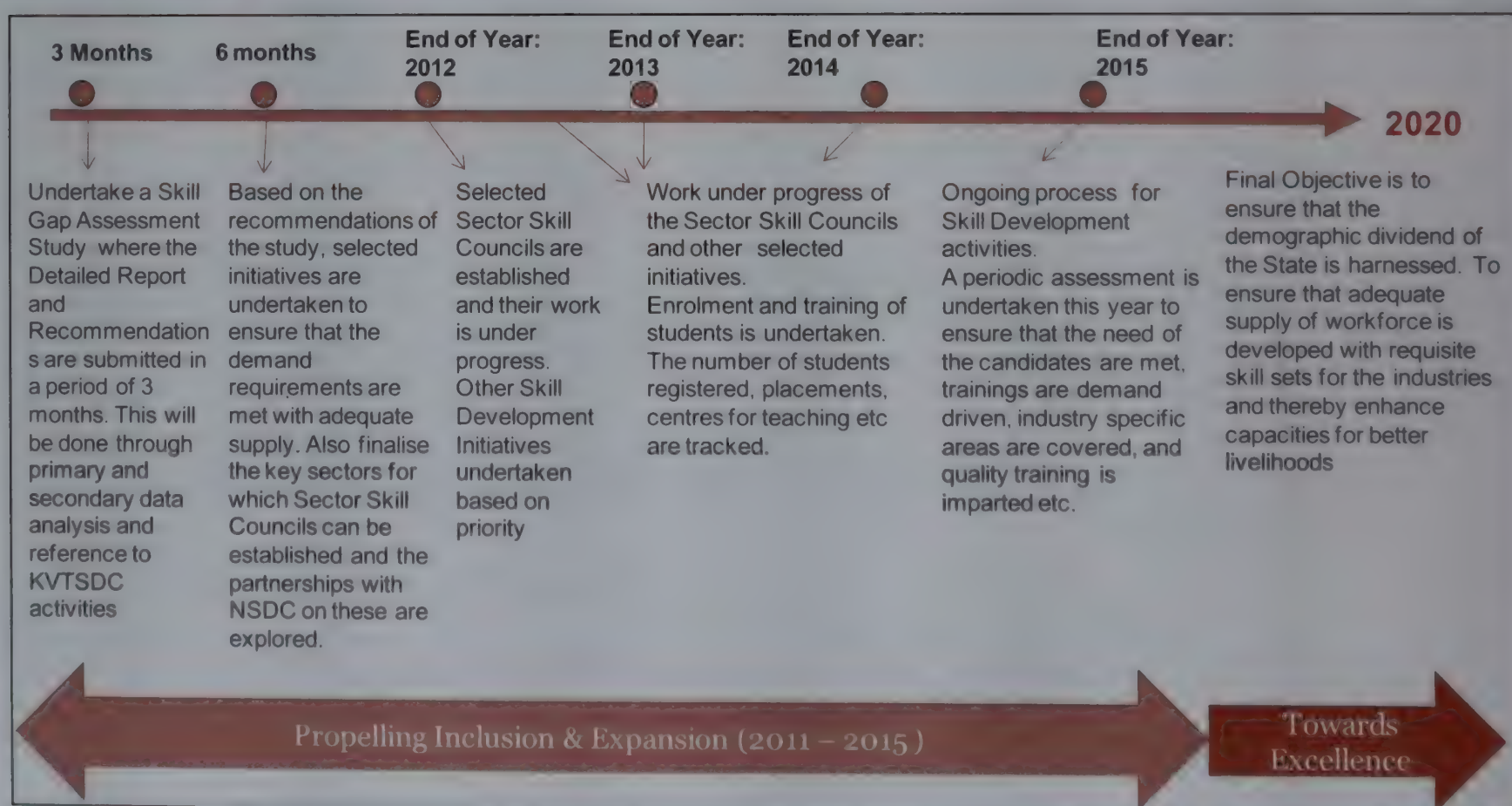
Entrepreneurship, Innovation, Private partnerships	
1.10 Create incubation centres to promote and encourage entrepreneurship and leadership among the youth of the State	
Component of Knowledge	Knowledge Application
Outcome	An entrepreneur friendly environment with appropriate policy thrust and factor advantages for the youth of the State
Particulars	<ul style="list-style-type: none"> ▪ The State needs a multi-pronged approach to create infrastructure and an environment to harness the potential and creativity of young students in order to encourage them towards entrepreneurship and leadership. The key strategies include: <ul style="list-style-type: none"> ○ Identify and invite private investors/players to set up incubation centres ○ Provide funding and support Universities to set up incubation centres ○ Create a comprehensive plan for promotion of rural entrepreneurship with inputs from National Entrepreneurship Development Board ○ Develop procurement and commercialization strategies to promote innovative products ○ Coordinate with Karnataka Vocational Training and Skill Development Corporation (KVTSDC) to link all ITIs to incubation centres to encourage young entrepreneurs ○ The incubation centres can sensitise students on information related to loans (credit), process of creating start-ups, patenting, entrepreneurial and networking skills, etc to build necessary skill-sets
Similar Experience	<p>In India: n-Logue, incubation centre at IIT Chennai is the Internet Service Provider for rural areas. n-Logue has established 2,500 village information kiosks with dedicated broadband connectivity, offering agricultural information, health consultation, education, and insurance services. The kiosks have been set up by village entrepreneurs, who take bank loans to finance the initial costs.</p> <p>Globally: Warwick Manufacturing Group (WMG) is a case of an academic department at a University that improves competitiveness through the application of innovation, new technologies, skills and entrepreneurship development, thereby bringing in academic rigor to industrial and organizational practice.</p>
Who?	Depending upon the initiatives, this would require involvement of Karnataka State Innovation Council, Department of Higher Education, Department of Labour, Department of Industries & Commerce, Department of Urban Development, Department of Technical Education etc.
How much?	<p>The indicative costs for setting up Incubation Centres in State Universities and linking them to ITIs would be around INR 17 crores. The components include:</p> <ul style="list-style-type: none"> ▪ Provide funding and support Universities to set up incubation centres (@ INR 1 crore per university for 16 State Universities in Karnataka) = INR 16 crores ▪ Link all ITIs to incubation centres (@ Rs.50000 per institute for 50 institutes per year, to start with) = INR 25 lakhs ▪ The costs of setting up incubation cells in partnership with private players would depend upon individual terms of agreement. ▪ Running costs of these initiatives would depend upon scalability and expanse of initiatives.
Indicator	<ul style="list-style-type: none"> ▪ No. of partnerships with Private players setting up and managing Incubation Centres ▪ No. of Universities and ITIs having an Incubation Centre or linked to it ▪ No. of young entrepreneurs benefitted through formation of Incubation Centres etc.

Time Phase

Phase I & II: 2011 – 2015



	purpose of workforce development of particular industry sectors. So far SSCs have been incorporated for Auto, Security, Energy sectors and are in pipeline for sectors like: Retail, Media & Entertainment, IT/ITeS, Foundry, Healthcare, BSFI, Electronics and Hardware. (Source: www.nsdcindia.org)
	Globally: Industry Skill Councils (ISC) in Australia are independent, professional and not-for-profit bodies set up to work with related industries across all areas to define the emerging skill specifications for the workforce. They are funded by the Australian government. As on 2005, there were 10 different skill councils in Australia. The councils are constituted for industries ranging from agri-food industry to manufacturing to construction and property to services. Examples of functions performed by the Manufacturing Industry Skills Council that covers about 75,000 enterprises.
Who?	Karnataka Vocational Training & Skill Development Corporation Ltd (KVTSDC), Directorate of Employment and Training in collaboration with the National Skill Development Corporation (NSDC)
How much?	Undertake a State wide Skill Gap Assessment Study which would vary between Rs 25- 30 lakhs. The study would help to identify the key growth sectors and the skill gaps in them with respect to current and projected demand and supply. This study will also provide strategy for formation of sector specific skill councils and related indicative funding implications considering national SSC constitutions
Indicator	No. of persons trained No of trainees placed in the industry No. of initiatives and programmes undertaken No. of Sector Skill Councils constituted specific to the State
Time Phase	Phase I& II: 2011 -2015



Skill Development through Private Partnerships

1.9 Set up vocational education institutions in PPP mode to integrate and institutionalise the vocational education and training systems.

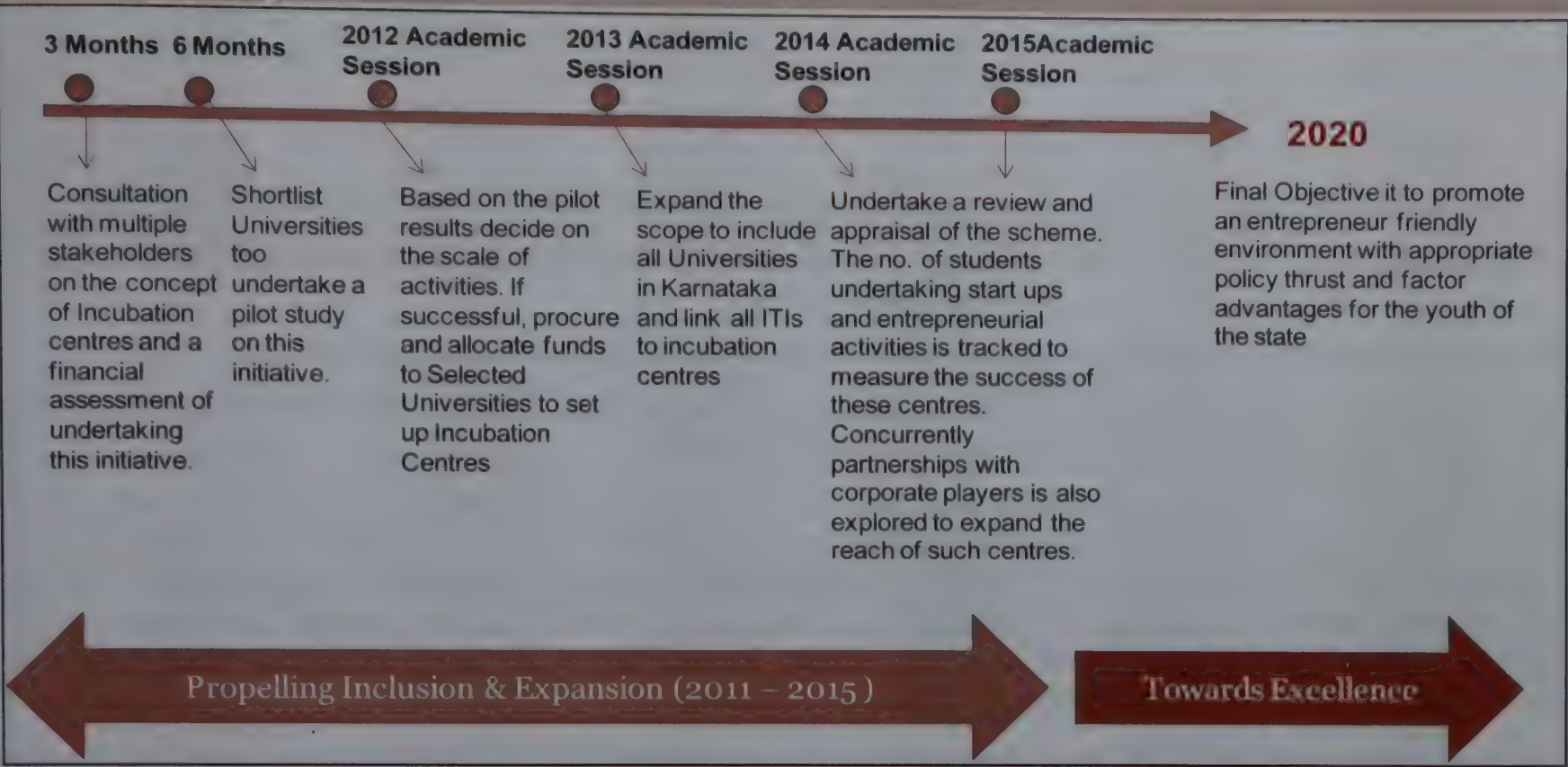
Component of Knowledge	Knowledge Dissemination
Outcome	Bridging the demand supply mismatch between the education systems and industrial requirements and increasing access and coverage
Particulars	<ul style="list-style-type: none">▪ Partner with private sector and industries to set up Vocational Education Institutions. As a policy, incentives and Concessional financing could be made available for setting up such institutions.▪ As per World Bank studies - public vocational provision has tended to focus on pre-employment training only and its reach and availability needs to be expanded. The value propositions for Private Participation in VET include:<ul style="list-style-type: none">○ Greater Access: by providing flexibility and reaching out to masses○ Facilitation of Industry Collaborations: offering learners both course credibility and potential employment.○ Job placement support: including guidance services, career counselling etc.○ Quality Training: in job specific skills, communication skills, technology, sector specific etc.
Similar Experience	<p>In India:</p> <ul style="list-style-type: none">▪ KVTSDC has already undertaken several initiatives in PPP mode in Karnataka. These can be further expanded to ensure greater coverage.▪ TeamLease Services is set to start the first University of Vocational Education in Gujarat with 22 community colleges across Gujarat.▪ NSDC provides funding to private players to set up skill development and VT institutions <p>Globally:</p> <p>Technical and Vocational Education and Training is a central item on the agendas of both UNESCO and ILO. Both organizations are aware that education and training are rapidly becoming inseparable, especially as the notion of a job for life is being replaced by the necessity for lifelong learning.⁶⁰</p>
Who?	Karnataka Vocational Training and Skill Development Corporation (KVTSDC) in collaboration with various departments/organisations like Department of Higher Education, Department of Employment and Training, NSDC, NASSCOM, CII, FICCI, Karnataka Chamber of Commerce & Industries, Semi Government bodies, Public Sector Units and various Corporate players.
How much?	This initiative is based on the partnerships and collaborations between Government and Private players. It mainly has policy level implications and the specific costs incurred would depend upon the nature of the agreements.
Indicator	<ul style="list-style-type: none">▪ Number of Vocational Education Institutions formed with private partnerships.▪ Number of students enrolled and trained▪ Number of trainees placed in the industry
Time Phase	This initiative is already ongoing and can be further expanded on a concurrent basis. [As a result, a separate timeline is not provided]

⁶⁰ ‘Participation in formal, technical and vocational education and training programmes worldwide’ , UNESCO (2006)

Entrepreneurship, Innovation, Private partnerships	
1.10 Create incubation centres to promote and encourage entrepreneurship and leadership among the youth of the State	
Component of Knowledge	Knowledge Application
Outcome	An entrepreneur friendly environment with appropriate policy thrust and factor advantages for the youth of the State
Particulars	<ul style="list-style-type: none"> The State needs a multi-pronged approach to create infrastructure and an environment to harness the potential and creativity of young students in order to encourage them towards entrepreneurship and leadership. The key strategies include: <ul style="list-style-type: none"> Identify and invite private investors/players to set up incubation centres Provide funding and support Universities to set up incubation centres Create a comprehensive plan for promotion of rural entrepreneurship with inputs from National Entrepreneurship Development Board Develop procurement and commercialization strategies to promote innovative products Coordinate with Karnataka Vocational Training and Skill Development Corporation (KVTSDC) to link all ITIs to incubation centres to encourage young entrepreneurs The incubation centres can sensitise students on information related to loans (credit), process of creating start-ups, patenting, entrepreneurial and networking skills, etc to build necessary skill-sets
Similar Experience	<p>In India: n-Logue, incubation centre at IIT Chennai is the Internet Service Provider for rural areas. n-Logue has established 2,500 village information kiosks with dedicated broadband connectivity, offering agricultural information, health consultation, education, and insurance services. The kiosks have been set up by village entrepreneurs, who take bank loans to finance the initial costs.</p> <p>Globally: Warwick Manufacturing Group (WMG) is a case of an academic department at a University that improves competitiveness through the application of innovation, new technologies, skills and entrepreneurship development, thereby bringing in academic rigor to industrial and organizational practice.</p>
Who?	Depending upon the initiatives, this would require involvement of Karnataka State Innovation Council, Department of Higher Education, Department of Labour, Department of Industries & Commerce, Department of Urban Development, Department of Technical Education etc.
How much?	<p>The indicative costs for setting up Incubation Centres in State Universities and linking them to ITIs would be around INR 17 crores. The components include:</p> <ul style="list-style-type: none"> Provide funding and support Universities to set up incubation centres (@ INR 1 crore per university for 16 State Universities in Karnataka) = INR 16 crores Link all ITIs to incubation centres (@ Rs.50000 per institute for 50 institutes per year, to start with) = INR 25 lakhs The costs of setting up incubation cells in partnership with private players would depend upon individual terms of agreement. Running costs of these initiatives would depend upon scalability and expanse of initiatives.
Indicator	<ul style="list-style-type: none"> No. of partnerships with Private players setting up and managing Incubation Centres No. of Universities and ITIs having an Incubation Centre or linked to it No. of young entrepreneurs benefitted through formation of Incubation Centres etc.

Time Phase

Phase I & II: 2011 – 2015



Health Sector Recommendations

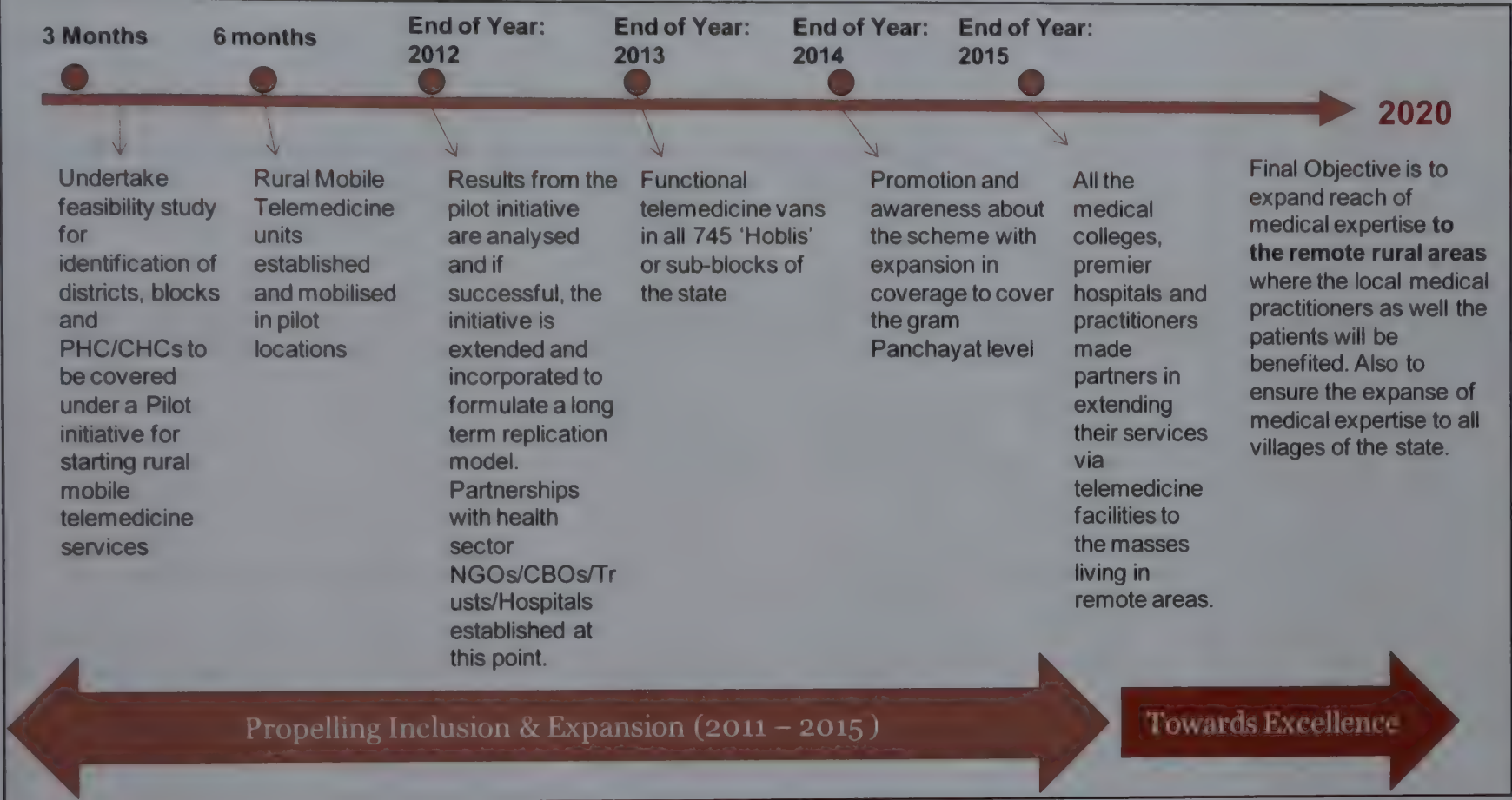
The key imperatives to be achieved in health sector are:

- a) Universal and affordable healthcare
- b) Improvement in service delivery through appropriate staffing and capacity building of healthcare staff
- c) Universal access to knowledge on basic health aspects like institutional delivery, child nutrition and development, hygiene, good practices on sanitation etc.
- d) Channelling ICTs and private engagements to reach out to the difficult to reach populations.
- e) Promotion of Medical Education by strengthening existing institutes and establishment of new centres of public health education, which undertake research and training.

At a policy level, a number of initiatives have been taken at both national level and state level to achieve the above. While these initiatives have started producing results, there is a need to resolve the institutional and staffing constraints that still persist at the grass root level health centres. Greater awareness on public health is also required among the masses and the role of the community participation and technology needs to mulled over and expanded in this respect. In this context, we suggest following specific recommendations to supplement the initiatives already being taken at various level.

ICT in Health	
2.1 Expand reach of medical expertise through technology - Rural Mobile Telemedicine Units	
Component of Knowledge	Knowledge Dissemination
Outcome	Expand reach of medical expertise to the remote rural areas where the medical practitioners as well the patients will be benefited.
Particulars	<p>The concept of Tele-medicine has taken roots in Karnataka and is being utilized in the all the districts.</p> <ul style="list-style-type: none">▪ Given the effectiveness of this initiative, efforts can be made to promote Rural Mobile Telemedicine Units in other areas across and within districts also so as to increase the outreach.▪ Collaborations can be made with pharmaceutical companies and Corporate to support the initiatives. Integration can be undertaken with the existing health system.▪ Local NGOs can act as nodal centres to facilitate collaboration.
Similar Experience	<p>In India:</p> <ul style="list-style-type: none">▪ Karnataka has already started telemedicine facilities in all the districts of the state.▪ Apollo Telemedicine Network Foundation (ATNF) has emerged as India's single largest turnkey provider in the area of Telemedicine with over 150 telemedicine centers across the globe. ATNF works with multiple entities including the Central and State Governments, medical bodies, private and public sectors, both at a national and international level to popularize the concept of Telemedicine.▪ Karuna Trust has experimented with Telemedicine in Karnataka by providing stationary telemedicine facilities at selected Karuna Trust PHCs in association with Narayana Hrudayalaya. <p>Globally:</p> <p>Telemedicine is a global phenomenon and most Government departments in developed countries like USA, UK etc have used telemedicine facilities to expand the outreach of medical expertise in difficult to reach areas.</p>
Who?	Department of Health in collaboration with Indian Space Research Organisation (ISRO)
How much?	<p>One Time Costs:</p> <p>The cost of establishing a Telemedicine unit including computer, IT equipments and Video Conferencing Unit would be in the range of Rs 4 - 8 lakhs based on indicative industry</p>

	estimates. <i>Recurring Costs:</i> The ongoing costs would include costs of maintenance incurred by NGOs, costs of hiring vans etc. This depends upon the level of activities undertaken.
Indicator	1. Facilities set up for telemedicine as in numbers of telemedicine vans brought in and also number of PHC/CHCs connected with telemedicine facilities. 2. Number of organizations collaborated with for telemedicine activities. 3. Increase in number of beneficiaries of telemedicine facilities.
Time Phase	Phase I & II: 2011 -2015

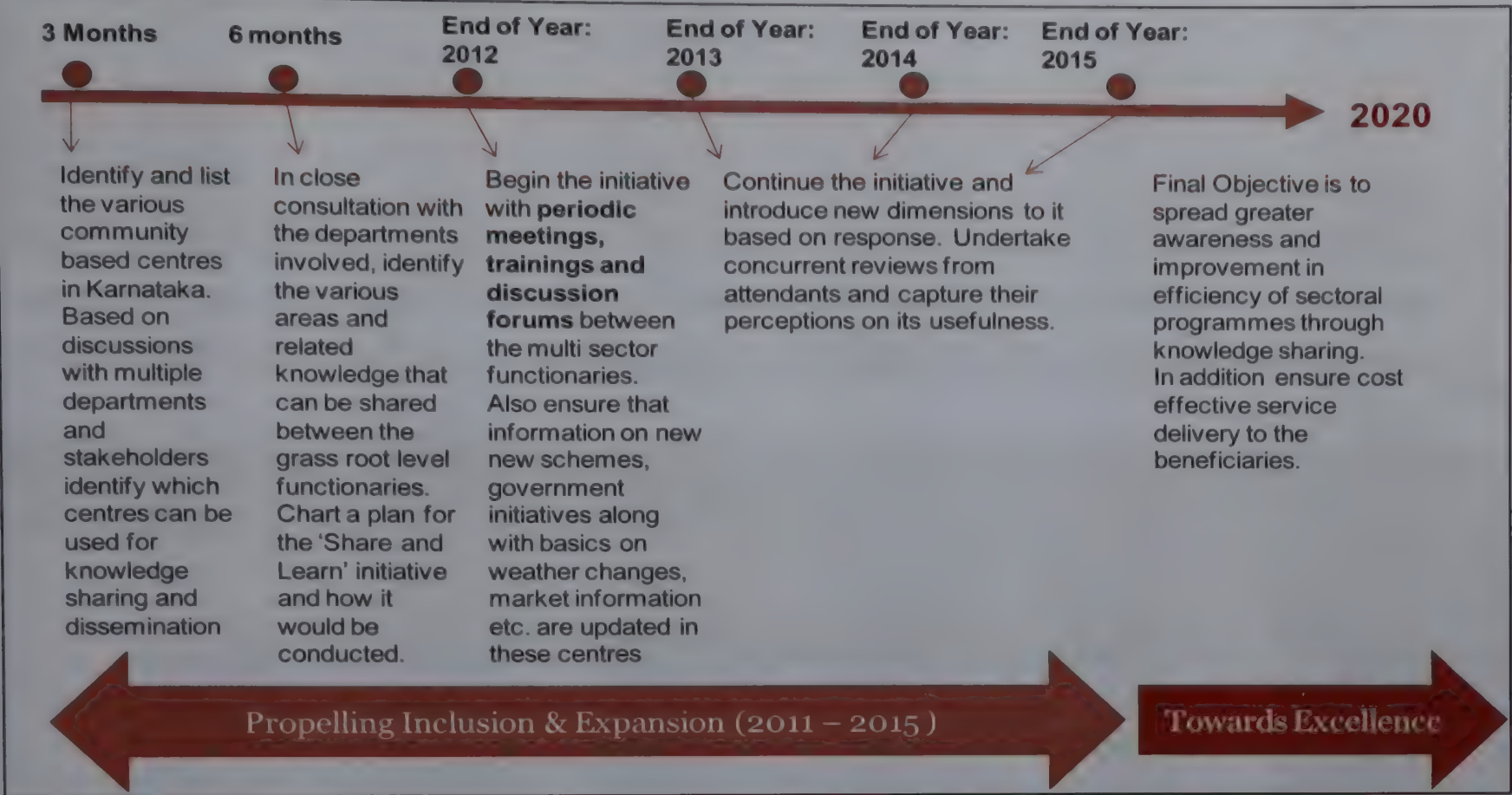


Collaboration and Knowledge Sharing

2.2 Undertake '*Share and Learn*' initiatives for multi-sectoral service providers making the local community based centre the point of convergence.

Component of Knowledge	Knowledge Dissemination
Outcome	<ul style="list-style-type: none"> Greater awareness and improvement in efficiency of sectoral programmes through knowledge sharing. Cost effective service delivery to the beneficiaries.
Particulars	<p>Quarterly learning and sharing sessions between inter sectoral service providers should be conducted under the 'Share and Learn' Programme to promote peer learning for all the grassroots functionaries such as ASHA/AWW along with teachers, elected representatives etc. to be conducted through group discussions, IECs etc. This would help in inducing motivation levels of grassroots functionaries and foster cross sectoral learning. The community based centres set up under multi sectoral schemes that can be considered for such initiatives include:</p> <ol style="list-style-type: none"> 1. Anganwadi Centres 2. Raitha Samparka Kendras 3. Krishi Vigyan Kendras 4. Primary Health Centres/ Community Health Centres 5. Other Local/Community based Centres 6. Libraries <p>Convergence of services can be undertaken through the following initiatives:</p> <ul style="list-style-type: none"> Periodic meetings between the various frontline service delivery professionals, community facilitators and representatives to share and communicate knowledge on latest schemes and scale of operations Availability of basic information like weather status, market information, geographical mappings etc. Earmarking counters at selected community based centers for attending special cases referred to under the education/health/livelihood related schemes. In addition these can also be used to spread knowledge and awareness to the locals on issues like institutional delivery, nutrition, sanitation, value education etc.
Similar Experience	<p>Globally:</p> <p>Mabamba and Lukwanga are Community Knowledge Centres initiated by the Nature Palace Foundation and the Arid Land Information Network with Environmental Alert respectively. These provide information related to agriculture and community development and have successfully enabled knowledge sharing in these areas.⁶¹</p>
Who?	Karnataka Knowledge Commission in collaboration with various inter linked departments including education, health, women and child development, rural development, urban development etc.
How much?	Since this initiative is based on systems strengthening and collaborations, it largely has policy level implications.
Indicator	Minimum number of hours per year allocated for collaboration and 'sharing and learning' in the work plans for the related schemes.
Time Phase	Phase I & II: 2011-2015

⁶¹ 'The Role of Community Knowledge Centers in enhancing Agricultural and Community Development through Information Exchange', David Kintu NKWANGA, 2010



Agricultural Sector Recommendations

The key imperatives to be achieved in agricultural sector are:

- Higher productivity and output per worker
- Spread of innovation in agriculture and related practices
- Channelling research into right areas and creating centres of excellence in areas of comparative advantage

We suggest following specific recommendations to supplement the initiatives already being taken at various level.

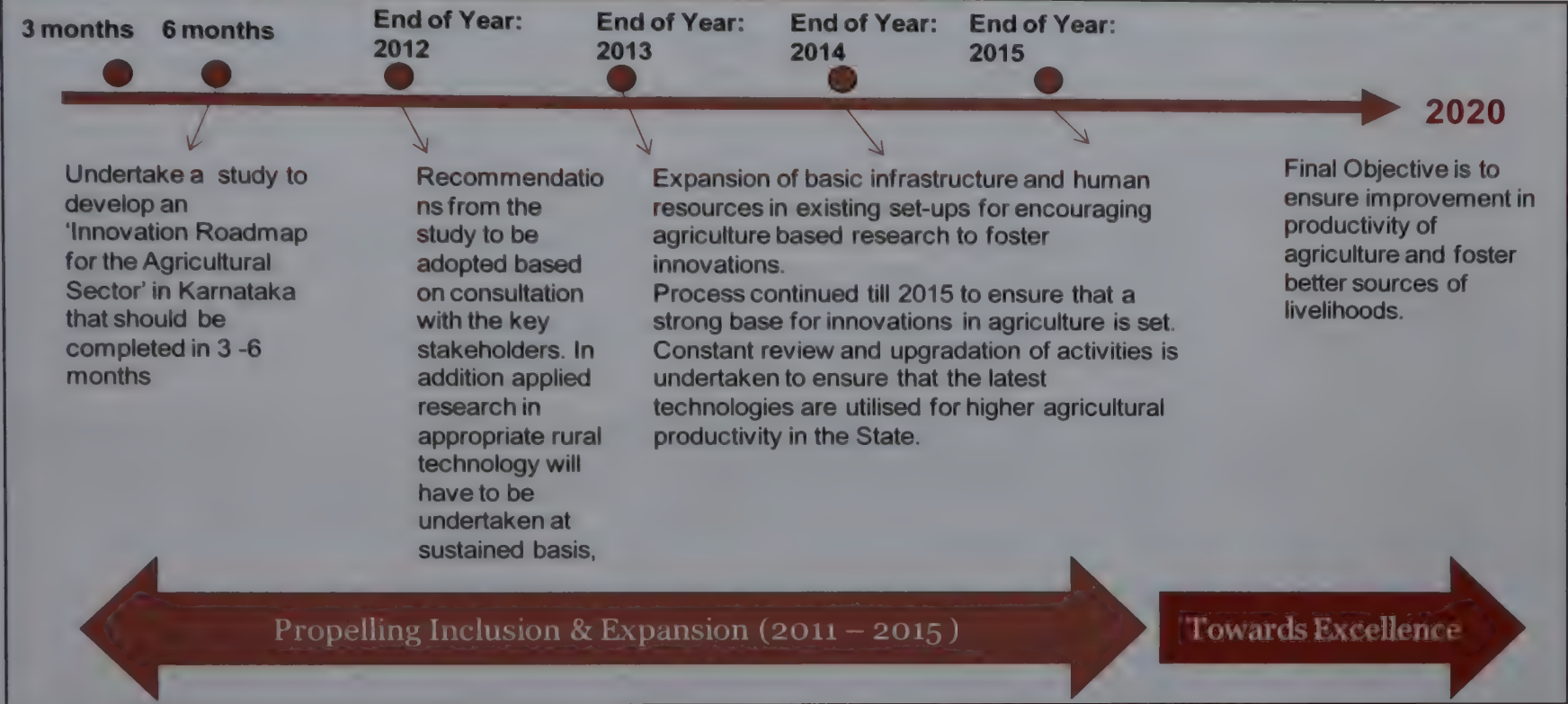
Innovation	
3.1 Formulate an <i>Innovation Roadmap</i> for promoting innovations in Agriculture	
Component of Knowledge	Knowledge Creation
Outcome	Improvement in productivity of agriculture and better sources of livelihoods
Particulars	<ul style="list-style-type: none"> Based on the principles of the National Innovation Council (NIC), the innovation paradigm should focus on inclusive innovation for, of & by the people at the bottom of the pyramid. 50% of Karnataka's population is engaged in agriculture and applicability of innovations in this sector holds key prominence. This roadmap should include: <ul style="list-style-type: none"> Strategies for innovative practices in farming, crop cycles and irrigation leading to higher productivity. Use of ICTs to develop and strengthen collaborations between researchers, academicians, market players and grass root level users. Financial allocations and accountability
Similar Experience	<p>In India</p> <ul style="list-style-type: none"> National Innovation Council and Karnataka State Innovation Council have been set up to foster innovation and growth nationally and in the state respectively. Institutions like ARTI are undertaking such initiatives and innovations have been recognized internationally especially in bio-fuel. <p>Globally</p> <ul style="list-style-type: none"> World Bank is supporting several initiatives for innovations in agriculture through support for expanding infrastructure, providing technical inputs, developing frameworks, facilitating networking process etc. for undertaking development of innovations in agriculture.
Who?	Karnataka State Innovation Council in collaboration with the Agricultural Department and other the concerned government departments, universities and research institutions in consultation with Karnataka Knowledge Commission.
How much?	<p>Major Cost Implications:</p> <ul style="list-style-type: none"> A study to develop an 'Innovation Roadmap for the Agricultural Sector' in Karnataka to be undertaken would cost in the range of INR 25-30 Lakhs. Applied research in appropriate rural technology will have to be undertaken at sustained basis, and may also require expansion of basic infrastructure and human resources in existing set-ups setting up of new infrastructure at later stages. Funding in the range of 30-40 crore may be required over a period of 5 years.

Indicator

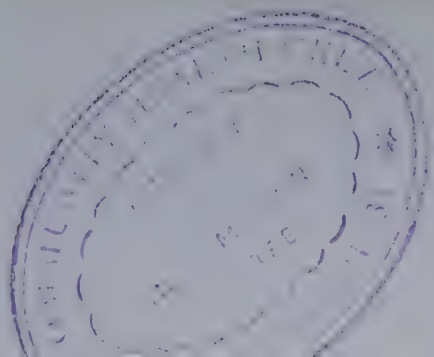
- Increase in agricultural productivity
- Increase in agricultural growth rate vis-à-vis [Goal≈ 3 % to 4% according to Vision 2020]
- Increase in number of new agro-based enterprises and R&D Institutions

Time Phase

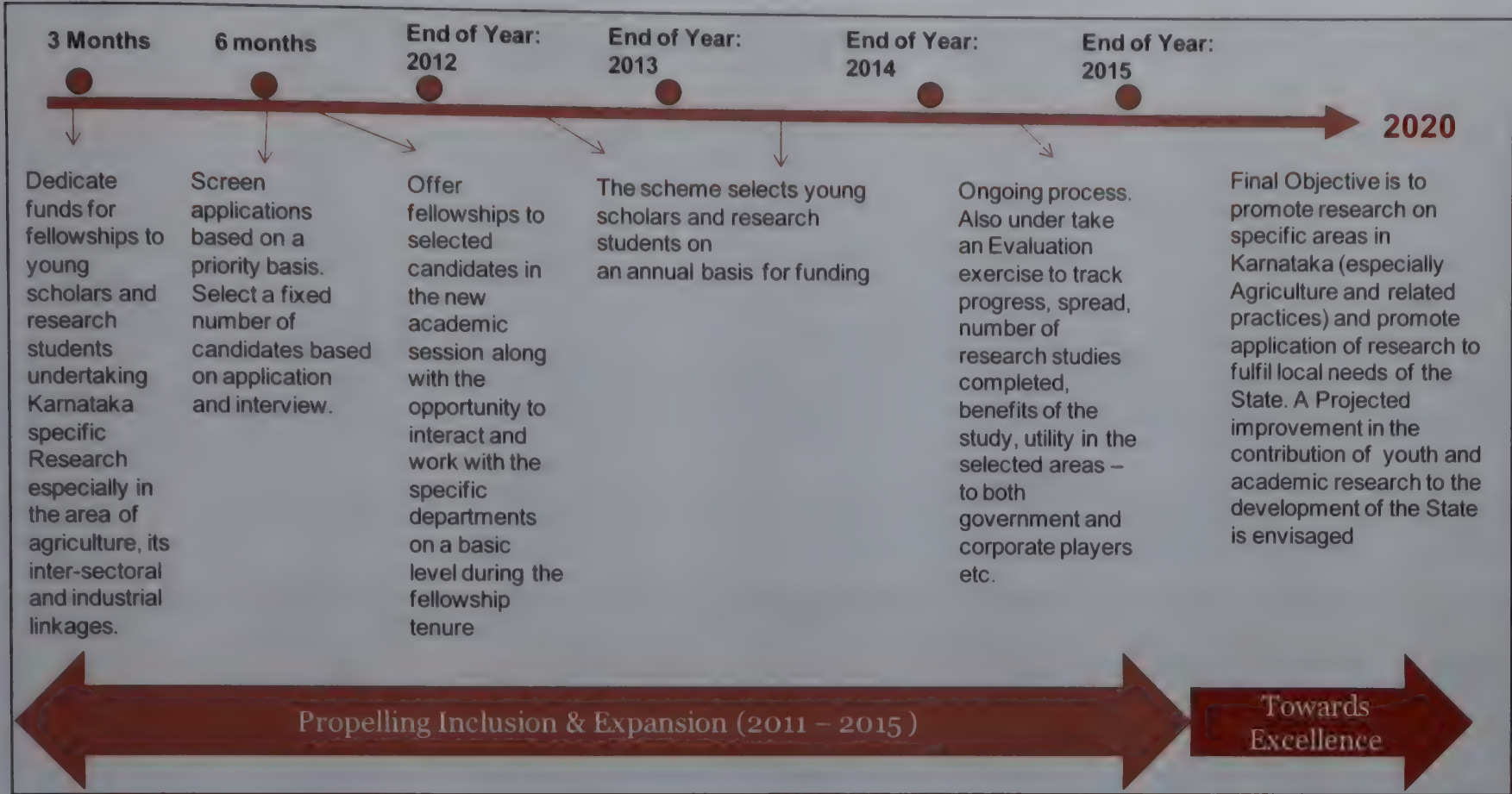
Phase I & II: 2011-2015



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Research & Development	
3.2 Promote Karnataka specific Fellowships for young scholars (with special focus on Agriculture and its inter sectoral linkages)	
Component of Knowledge	Knowledge Creation
Outcome	Promote research on specific areas in Karnataka (especially Agriculture and related practices) and promote application of research to fulfil local needs of the State
Particulars	<p>Start a fellowship and grants based programme for young scholars and researchers undertaking studies on Karnataka specific areas with focus on agriculture, its inter-sectoral and industrial linkages, to promote selected sectors and areas of study in the State.</p> <ul style="list-style-type: none"> Based on the Governments agenda, identify a few themes and sectors for promoting research and youth participation. This can focus on - agriculture, innovation and can also look at its inter-sectoral linkages with education, health, social sector etc. The fellowship/grant would be applicable for young aspirants who want to pursue research work in these specific areas prioritised by the Government. Introduce the fellowship scheme in all Agriculture and allied Universities and colleges with higher educational departments Universities can screen the applications and select the most relevant ones based on set criteria for selection
Similar Experience	<p>In India:</p> <ul style="list-style-type: none"> The concept of State specific research fellowships is comparatively new in India. Gujarat government has started a Fellowship Program for youth, directed at addressing areas of highest priority for the State Government, especially improving the Human Development Index of the State. The objective of the Fellowship is to promote creative and innovative thinking from the youth to address issues like: agricultural productivity, raising the quality of education, improving child nutrition, reducing maternal mortality and strengthening progress in rural areas through mitigation of poverty and creating livelihood opportunities. Biotechnology specific Research is also encouraged by the State Government of Gujarat by provision of funding. <p>Globally:</p> <p>The concept of fellowships for country, region and geographical area specific research is common in most leading global Universities. There are several grants to promote research on parts of Africa and other developing nations which is offered to students and research scholars.</p>
Who?	Karnataka State Innovation Council, Karnataka State Department of Agriculture, Department of Higher Education in consultation with Karnataka Knowledge Commission
How much?	<p>Cost Implications:</p> <p>Fellowships for researchers @ Rs 10,000 per month could be considered for candidates choosing Karnataka specific topics. To start with 50 candidates can be selected for fellowship per year. The total cost in that case would be in the range of Rs 60 Lakhs per year.</p>
Indicator	<ul style="list-style-type: none"> Increase in number of researchers working on local issues including agriculture Increase in number of research studies undertaken Increase in number and amount of scholarships awarded
Time Phase	Phase I & II: 2011-2015



Urban Development Recommendations

The key imperatives to be achieved in urban development sector are:

- a) Livelihood Enhancement
- b) Development of social, technical and intellectual capital and infrastructure in Tier I and Tier II cities of Karnataka
- c) Development of satellite urban centers in the State
- d) Improvement in policy thrust and opportunities for Entrepreneurship Development
- e) Strengthening the facilities and infrastructure for pursuing research in sustainable development

We suggest following specific recommendations to supplement the initiatives already being taken at various level.

Information & Communication Technology	
4.1 Build and develop information technological infrastructure in major cities of Karnataka	
Component of Knowledge	Knowledge Dissemination
Outcome	Spreading connectivity and broadband services to major cities would give a voice to the people, promote businesses, establish connectedness and would transform them into local leaders and global competitors. This will foster a holistic urban development of the State
Particulars	<ul style="list-style-type: none">Bangalore is an IT hub and Silicon Valley of India. Based on the city's example and liaising from the growth of IT and ITeS industry in the State, develop other of major cities and urban conglomerates like Mysore, Mangalore, Dharwad etc.Adopt an integrated approach to urban planning to cope with the rising infrastructural and developmental challenges.Integration here would be with technology and electronic networks, to facilitate connectivity, broadband services and ICT4D to foster effective communication between the people, schemes, departments etc. Rather than planning for the separate provision of ICTs, electronic connectivity etc, for example, a more holistic view is can be adopted and technical capital can be integrated with already existing infrastructural development schemes and urban planning initiatives.This integrated approach also means that cities would need to establish partnerships and new forms of collaboration that allow them to deliver infrastructure requirements in new ways.This is surely a step towards 'Expansion' of facilities and a feasibility study can be undertaken to understand the possibilities (geographical and financial) of undertaking this on a large scale.
Similar Experience	<p>As per the 'Cities of the future' study undertaken by PwC, the enormous complexity of cities today means that the demands on their infrastructure are relentlessly challenging.</p> <p>Not only are the 'basic' needs of transport, housing, water and energy under strain, but new demands for effective communication for example, broadband and electronic networks are increasingly important elements of infrastructure provision.</p> <p>Since the IT and ITeS Industries in Karnataka are expanding rapidly, cities of the State can benefit from the industrial spillovers and develop strong electronic networks in themselves and with other cities to promote integration of initiatives.</p> <p>In India:</p> <p>Cities like Delhi, Bangalore etc are building on the strong cultural, financial and trade links between the city's population and the emerging economic powerhouses.</p>

Globally:

UK - The UK government decided to provide each home in UK with a broadband connection with a single government portal with the websites of all the departments. The pilot for the scheme was launched in February, 2008 where 20000 families were benefited from the scheme. A total of £300 million is being spent on the scheme. It has the aim to get every family in the country online by the year 2011. Grants are also provided to poor households to buy computers and hardware required.

Chicago - is successfully celebrating and harnessing cultural diversity and, learning lessons from its recent economic renaissance and has spread networks and connectivity throughout its periphery.

China – (particularly Guangzhou in Southern China) is building on links with Chinese students, residents and the large investors who are key stakeholders in many city developments and are connected through electronic and infrastructural networks.

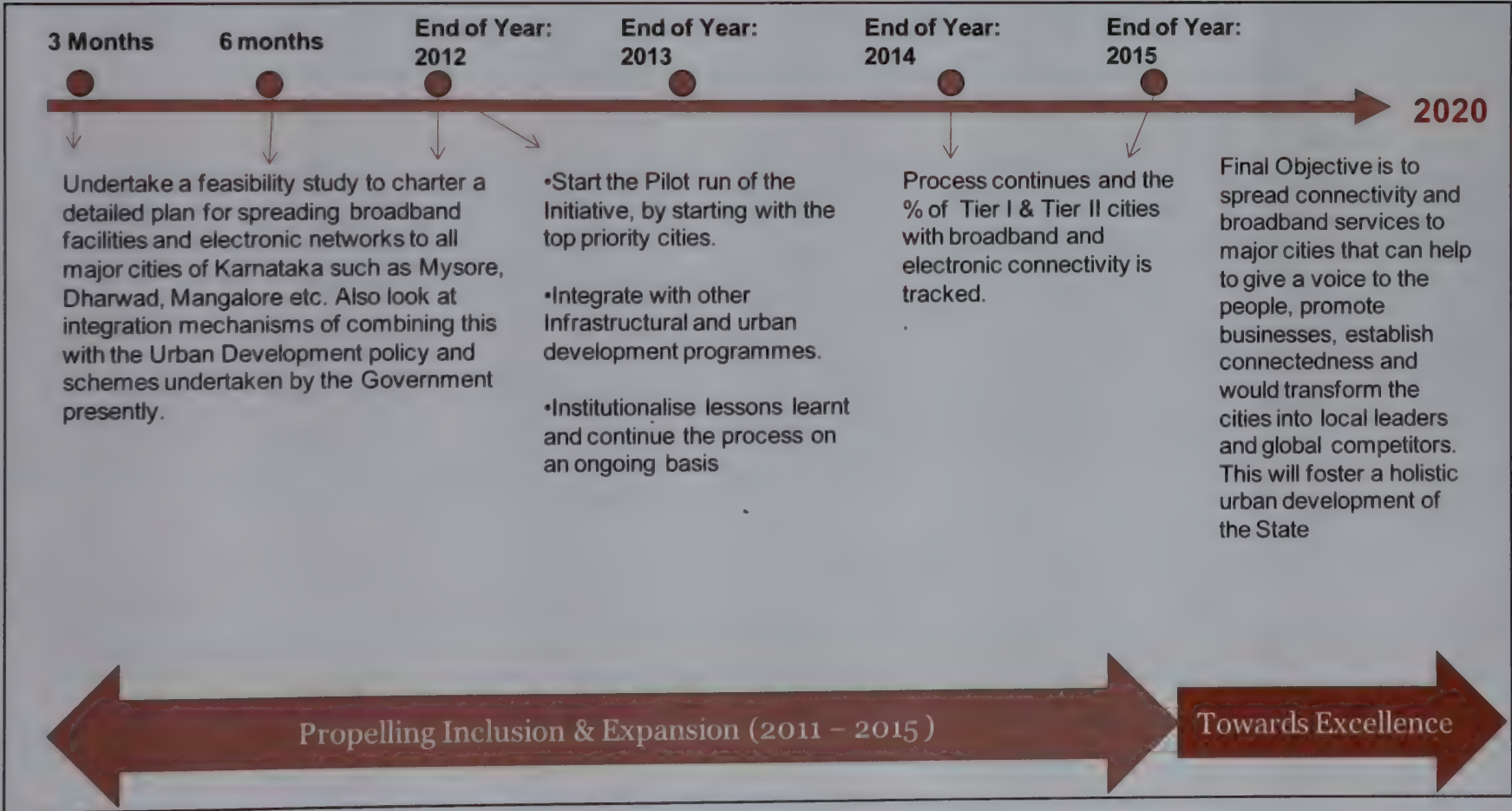
Who? Department of Urban Development and Information and Broadcasting in consultation with KKC

How much? Undertake a **feasibility study** to chart out the plan of action to provide electronic networks and broadband connectivity to all major cities of the State. Also look at integration mechanisms of combining this with the Urban Development policy and schemes undertaken by the Government presently.

This study would be in the range of INR 35-40 lakhs and would be followed by a step by step strategy to implement electronic connectivity in the selected cities on a pilot basis. This cost would depend upon the strategy adopted and cities selected.

- Indicator**
- Percentage of Tier I & Tier II cities in Karnataka connected with broadband facilities vis-a-vis [Goal ≈ 100]
 - Internet penetration levels in the state

Time Phase Phase I & II: 2011 -2015



Rural Development Recommendations

The key imperatives to be achieved in rural development sector are:

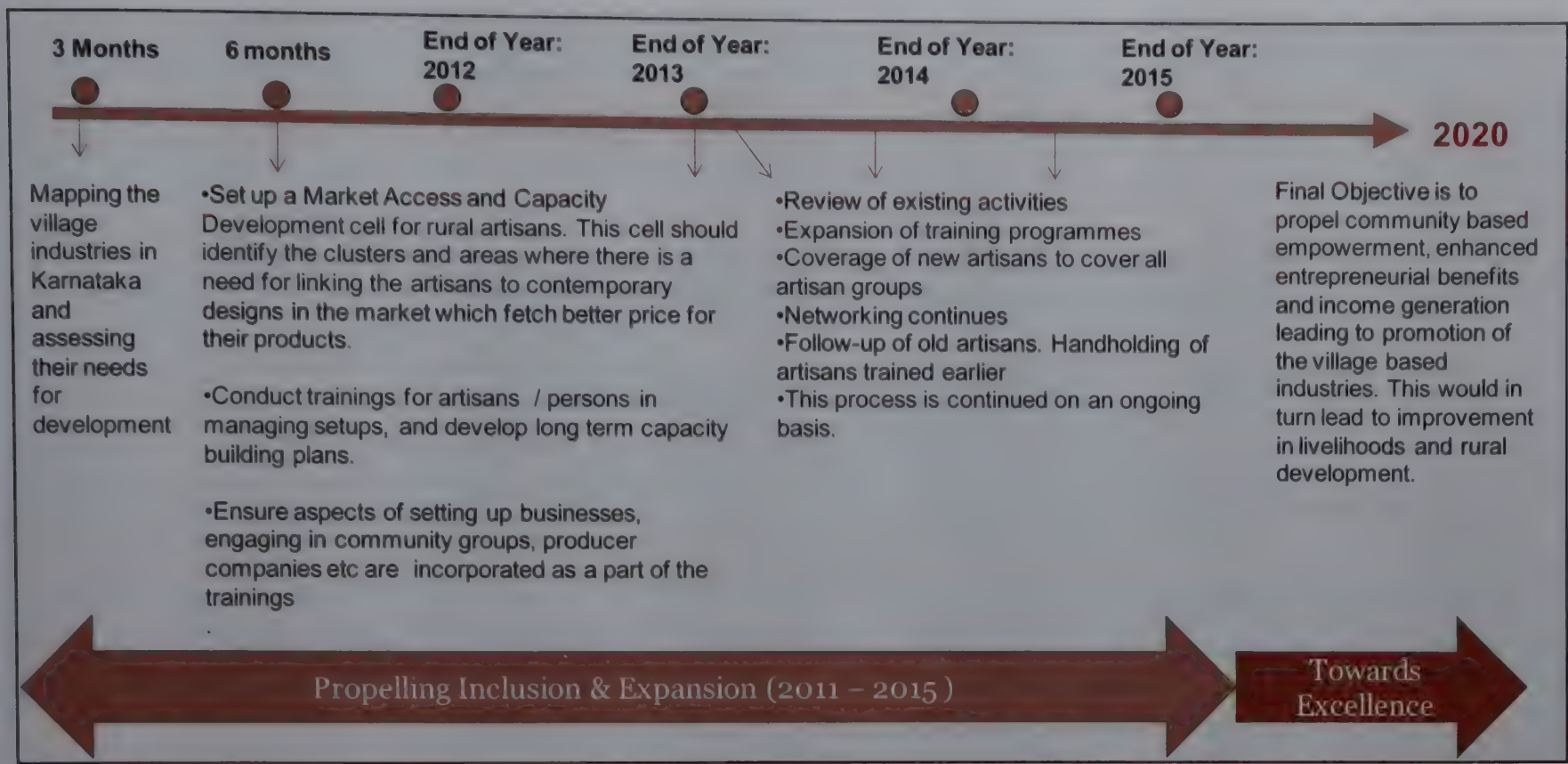
- Enhanced entrepreneurship and livelihood diversification in the rural economy (including rural farm and non-farm sector)
- Link villagers, academicians, researchers and industry players through appropriate knowledge sharing
- Documentation and development Traditional Knowledge

We suggest following specific recommendations to supplement the initiatives already being taken at various level.

Village Industries in Karnataka

5.1 Market access and capacity development of artisans in village industries of Karnataka

Component of Knowledge	Knowledge Dissemination
Outcome	Trained artisans, community based empowerment, entrepreneurial benefits and income generation leading to promotion of the village based industries. This would in turn lead to improvement in livelihoods and rural development.
Particulars	<p>Set up a Market Access and Capacity Development cell for rural artisans. This Cell should identify the clusters and areas where there is a need for linking the artisans to contemporary designs in the market which fetch better price for their products. The cell would facilitate:</p> <ul style="list-style-type: none"> Training for improving designs and quality through workshops organized by designers Capacity building of the artisans / persons working in village industries for facilitating micro-credit, systematic functioning of the production and marketing setups, etc. Incorporating aspects of doing business, community participation, producer company model etc are incorporated and informed. Facilitation should be provided where required. Research and development for improvising products and introducing new ones Networking for developing markets for the products
Similar Experience	<p>In India:</p> <ul style="list-style-type: none"> The Central Silk Board, Khadi & Village Industries Commission, etc are currently implementing schemes for the development of village industries. NABARD Bank provides credit to support the groups / clusters for promoting the village industries. CAPART also supports such activities. Non-profit organizations are also active in promoting the village industries. <p>Globally:</p> <p>UN bodies like UNDP promote the rural industries as a part of livelihoods promotion activities under development projects.</p>
Who?	Department of Employment and Training, Rural Development and Panchayati Raj, Khadi and Village Industries Commission and Karnataka Silk Industries Corporation in consultation with KKC
How much?	Series of Capacity building and training workshops need to be conducted. A budget of INR 1 Lakh/workshop would be required to cover covering a batch of 25 artisans per batch. Market promotion, innovations, facilitation of community participation etc. may entail cost depending upon scale of activities and new infrastructure.
Indicator	<ul style="list-style-type: none"> Improved sales of handicraft product vis-à-vis [for silk Goal≈ 16000 MT @ 5% annual increase according to Vision 2020] Capacity building of 25000 artisans / persons engaged in marketing Number of artisans engaged in community based business partnerships, producer company models, and entrepreneurial activities in this sector.
Time Phase	Phase I & II: 2011 -2015

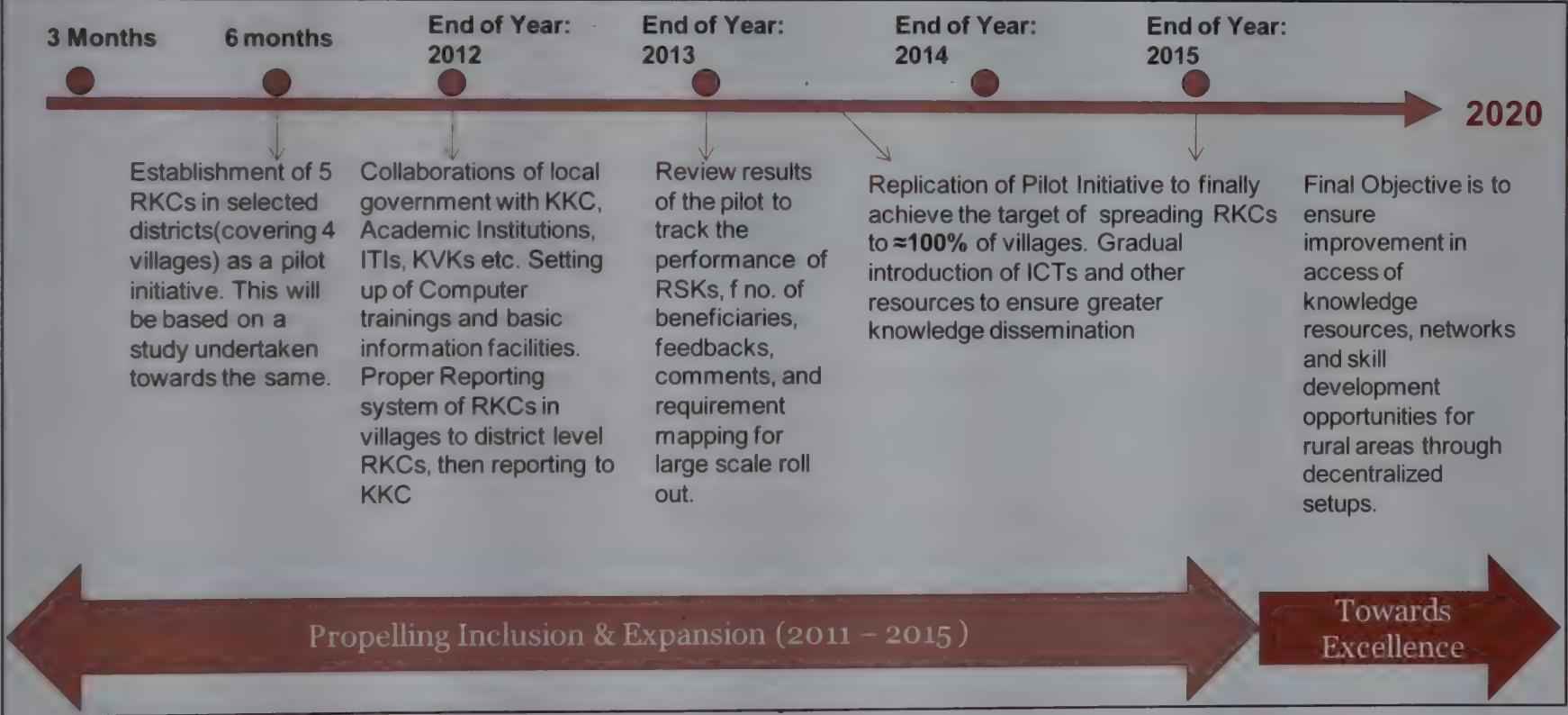


Communication and development through local participation

3.2 Establish Knowledge Centers in the rural areas to promote knowledge dissemination and communication

Component of Knowledge	Knowledge Dissemination
Outcome	Improvement in access of knowledge resources, networks and skill development opportunities for rural areas through decentralized setups.
Particulars	<ul style="list-style-type: none"> Establishment of Knowledge Centers in the rural areas (Rural Knowledge Centers) with a bottom up approach for knowledge dissemination To ensure that the knowledge reaches the grass root level, district and village level Rural Knowledge Centers (RKC) can be established for benefit of farmers, health workers, ANMs, teachers, self-help groups and children. It can be linked to knowledge networks and skill development initiatives <p>Activities include:</p> <ul style="list-style-type: none"> Kiosks to provide easy accessibility for geographic, cultural, agricultural and industrial information and educational/healthcare related institution mapping on the village, taluk and district. Computers with internet connectivity to update resources and link with the other knowledge centers and networks. Separate terminal for children where they can learn to operate computer, access curricular and co-curricular knowledge resources. Community Radios, Telemedicine Rural Mobile Unit equipments for example can be stationed at these Centres where possible. Skill development seminars and classes can be undertaken in the RKC's <p>The activities can be first started on a pilot basis with 5 centres - one nodal centre at district level and 4 at village level on pilot basis. The district level officials would collaborate with the Knowledge Commission regarding new schemes, knowledge resources and networks etc that can be introduced at the villages. The Commission will facilitate and track the knowledge based activities conducted in these Centres.</p> <p>Moreover one of the pre-existing centres set up under one of the multi sectoral schemes can also be also utilised for this purpose. Some examples are listed below:</p> <ol style="list-style-type: none"> 1. Anganwadi Centres 2. Raitha Samparka Kendras 3. Krishi Vigyan Kendras 4. Primary Health Centres/ Community Health Centres 5. Other Local/Community based Centres 6. Libraries
Similar Experience	<p>In India:</p> <ul style="list-style-type: none"> M.S Swaminathan Trust Chennai propagated the concept of Village Knowledge Centres in India with Kiosks providing a variety of Information to the rural population through effective use of ICT4D. These centres are managed by ICT self-help Groups and are expected to empower the rural communities with relevant and timely information on weather, crop management, crop prices, education and health or welfare entitlements. This was also supported by NASSCOM and UNDP in a public private partnership set up. In 2006, a pilot run of Rural Digital Services in the Finance Department was initiated in Karnataka. Established under a public-private partnership model by one or two private

	<p>companies chosen through a competitive and transparent bidding process, this process provided e-Governance facilities through ICT4D. It was envisaged to increase it to majority of the State's villages post the pilot run.</p> <ul style="list-style-type: none">▪ The RKC's can encompass the RDS initiative as well as other State level initiatives for knowledge dissemination.
Who?	Karnataka Knowledge Commission in collaboration with: Department of Education, Directorate of Mass Education, Department of Rural Dev. & Panchayati Raj, Department of Health and Family Welfare
How much?	<p>Assuming the office space and facilities to be provided by the State Government, the recurring cost would be in the range of INR 50,000 per month including a one 'knowledge facilitator' per centre.</p> <p>Additional advertising and promoting cost in the range of Rs 10 Lakhs would be incurred to spread awareness on the RKC's on a local and state level. There would be further costs depending upon the scale of the activities like training of employees, users, etc.</p>
Indicator	<ul style="list-style-type: none">▪ % of villages with 1 RKC established vis-à-vis [Goal ≈100%]▪ Increase in number of persons accessing services of Rural Knowledge Centers▪ Increase in number of children accessing computers in Rural Knowledge Centers▪ Skill development activities and seminars undertaken at the RKC's▪ Collaboration of RKC's with it is, Academic Institutions and Corporate players
Time Phase	Phase I & II: 2011 -2015



Collaborations through ICT's, Partnerships with NGOs/CBOs. Private Players	
5.3 Subsidize and encourage the use of Community Radios to universities, colleges, researchers and NGOs/CBOs	
Component of Knowledge	Knowledge Dissemination
Outcome	Establishing Knowledge Networks between grass root level rural beneficiaries, academicians and researchers. Greater community participation for resolving social issues.
Particulars	<p>Expand the network of Community Radios in Rural Areas of Karnataka to foster communication.</p> <ul style="list-style-type: none"> At present, there are 9 CRS⁶² in Karnataka. Considering their potential and utility, there is a need to expand and revive CRS set ups in the State. Non Profit Organizations and Academic Institutions can apply for setting up CRS which covers a given radius around them. In partnership with Non Profit entities and Academic Institutions the reach of CRS's can be extended to selected rural areas and then expanded for mass communication. The State government can start a CRS revival campaign, providing subsidies and incentives to encourage participation in rural areas and then enter into selective agreements for establishing, maintaining and operating a Community Radio Station (CRS) with NGOs and Academic Institutions
Similar Experience	<p>In India:</p> <ul style="list-style-type: none"> The spread of CRS in India started only in 2006 when the government of India notified new Community Radio Guidelines permitting NGOs and other civil society organizations to own and operate community radio stations. There are more than 80 CRS setups in the country at present which are run by NGOs or through Academic campuses. <p>Globally:</p> <ul style="list-style-type: none"> Community Radio is globally widespread means of communication The World Bank case studies for fostering development includes cases on how community radio has prospered in sub Saharan Africa and other developing nations
Who?	KKC in collaboration with Department of Information and Broadcasting
How much?	<p>A Community Radio Revival Campaign should be undertaken to spread awareness among local NGOs at a district level. This would be in the range of INR 30-40 Lakhs, in addition to collaborations with Universities, Knowledge Networks, local governments etc.</p> <p>Setting up costs for Community Radios: Usually the applicants are encouraged to receive funding from multilateral aid agencies. The Mo I&B sets specifics on eligibility conditions, advertising code, type of programmes etc. The CRS initiatives in the State can be subsidised for selected rural areas.</p> <p>Applying fee incurred by NGOs/academic institutions: The applicant may be required to furnish a Bank Guarantee of Rs.25, 000 at the time of signing the Grant of Permission Agreement (GOPA) to M/o I&B.</p> <p>Other fees include: requisite fee to WPC Wing of Ministry of Communication & IT for frequency allocation, Standing Committee on Frequency Allocation (SACFA) clearance and Wireless Operating License (WOL) etc.</p> <p>The Cost for Setting up one CRS:</p> <p><i>One Time Cost:</i> The cost of setting up a Basic CRS with recording and communication facilities is</p>

⁶² http://www.indiantelevision.com/special/y2k11/Radio_yearender.php

approximately Rs.10 Lakhs. Costs of mid-range modules which include Voice over boot facility can extend to Rs 19 Lakhs.

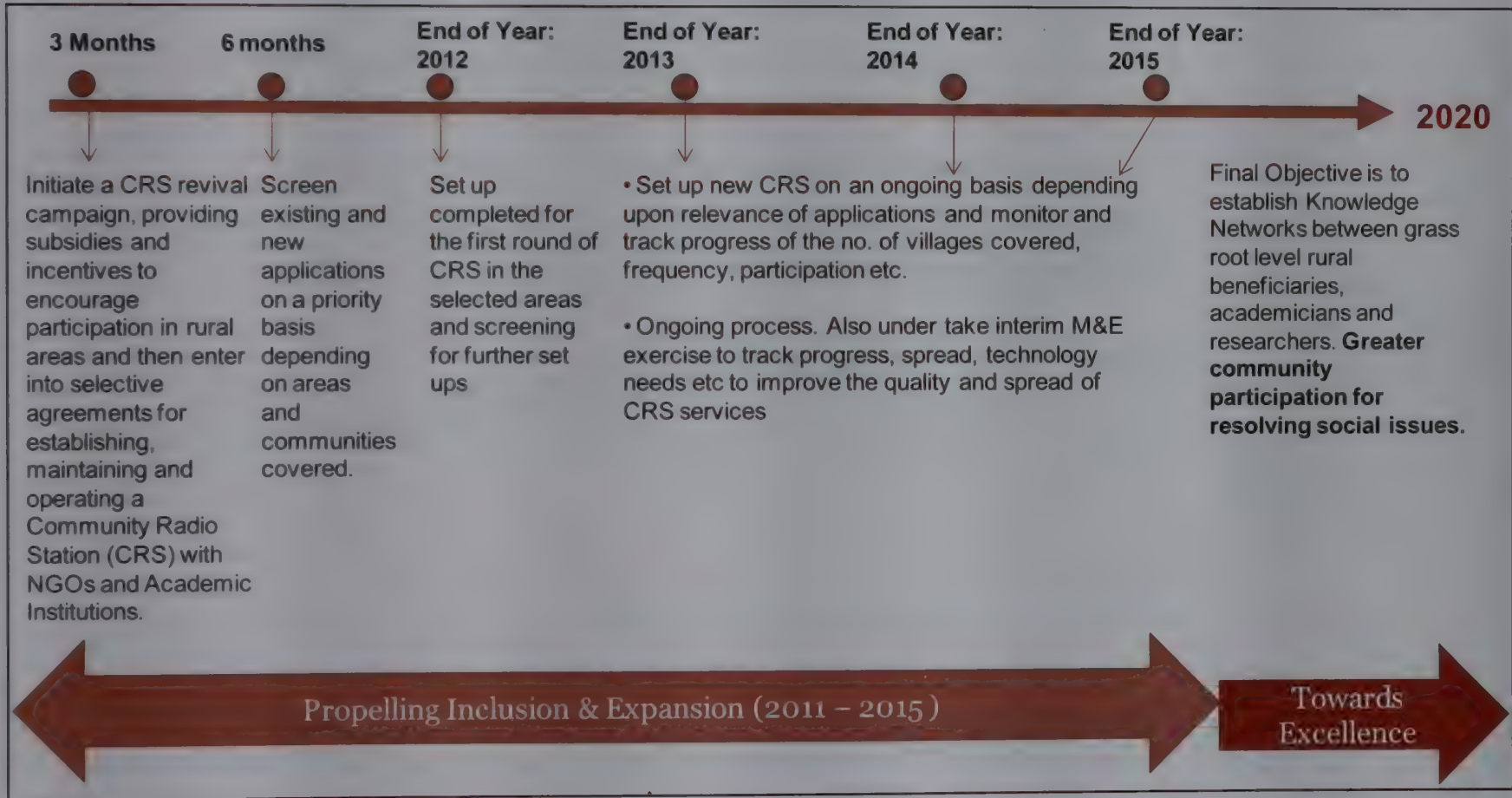
Recurring Costs:
Running costs and rental would be up to Rs.5, 000-8, 000 per month. However, as CRSs are set up in collaboration with NGOs or Academic Institutions this cost can be reduced.

Human Resources Cost would include one administrator for each system which would involve a cost in the range of Rs 2,000 per month.

The Government can provide subsidies with respect to the cost of establishment or could provide equipments and facilities for setting up the CRS in selected areas.

- Indicator**
- Increase in the number of villages being covered by CRS
 - Increase in number of persons participating in CRS activities
 - Increase in coverage of persons in local community for developmental activities and programmes

Time Phase Phase I & II: 2011 -2015

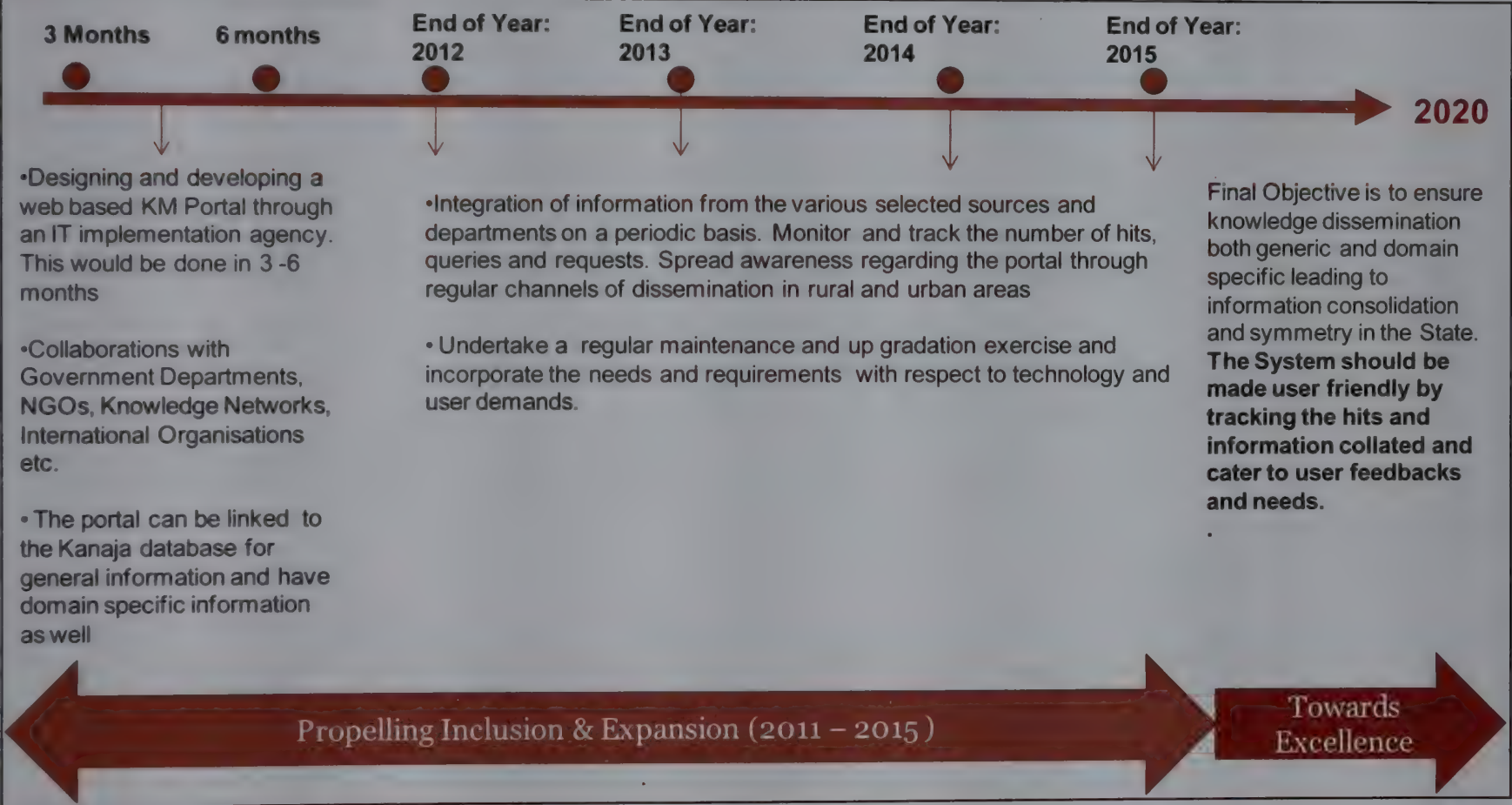


Grassroot Knowledge Networks

5.4 Establish an integrated Knowledge Management Portal combining Generic information from 'Kanaja' and Domain specific information from various government departments

Component of Knowledge	Knowledge Dissemination
Outcome	Knowledge dissemination both generic and domain specific leading to information consolidation and symmetry in the State. This initiative could encompass all the other initiatives and provide access to a variety of State related information at one place.
Particulars	<p>Establish an integrated Knowledge Management Portal which will encompass information on all the activities of Knowledge Creation, Dissemination and Application in Karnataka.</p> <p>This can be very useful especially for integrating all knowledge dissemination initiatives for the Raitha Samparka Kendras, (proposed) Rural Knowledge Centres, and Incubation Centres etc. The two components of the portal would include domain specific and generic information. 'Kanaja' the Kannada Wikipedia encompasses generic information on several areas and sectors. This portal would be a larger portal integrating Kanaja links for overall information and domain specific links for focussed knowledge.</p> <p>The value propositions for having domain specific information are many fold:</p> <ol style="list-style-type: none"> 1. Critical information on time for agricultural, Industrial, Health sectors etc. 2. It increases government's Intellectual quotient & depth of Knowledge base of society 3. It reduces operational expense by eliminating manual interventions 4. The approach makes the organisation eco-friendly – minimal paper usage 5. Transparent governance system <p>Domain specific areas may include:</p> <ul style="list-style-type: none"> ▪ Education: including Literacy and School Education, Vocational Education, Higher Education ▪ Health ▪ Agriculture ▪ Vocational Education and Skill Development ▪ Knowledge Networks ▪ Science & Technology ▪ Industries ▪ Innovations - linking up all the innovations, investment, enterprises to ensure that benefits can be widely shared among the communities.
Similar Experience	<p>In India:</p> <ul style="list-style-type: none"> ▪ Tamil Nadu has started Agrisnet – encompassing latest information on agricultural practices, innovations and developments. ▪ 'Grassroots Innovation Augmentation Foundation' has been set up by the Gujarat government for knowledge dissemination on innovation. ▪ Moreover the portal can be Interactive in nature and not just an information database. There can be scope for the users to interact, post queries, express opinions etc. The technology used in Kanaja for enabling text reading i.e. 'Hear Kanaja' can be liaised to facilitate this.

Who?	Karnataka Knowledge Commission in collaboration with all other Government Departments such as Dept. of Education, Health, Agriculture, Rural Development etc for fulfilling data requirements
How much?	<p>Major Cost Implications:</p> <p><i>One-Time Costs:</i> Designing and developing a web based a KM Portal through an IT implementation agency. The cost would be in the range of Rs 40-50 Lakhs with separate hardware costs depending upon size.</p> <p><i>Recurring Costs:</i> Maintenance Costs per month including the staffing and communication cost would depend upon the agreements with the departments and on the scope of information required in the portal.</p>
Indicator	Development of the KM Portal and monitor the use by tracking the increase in number of hits on the portal. Regular updation in content of the portal and tie ups with other departments and knowledge domain would indicate the scope of information encompassed in the Portal.
Time Phase	Phase I & II: 2011 -2015



Traditional Knowledge

5.5 Facilitate assimilation, sharing and profiling of Traditional Knowledge in Karnataka

Component of Knowledge Knowledge Creation, Dissemination and Application

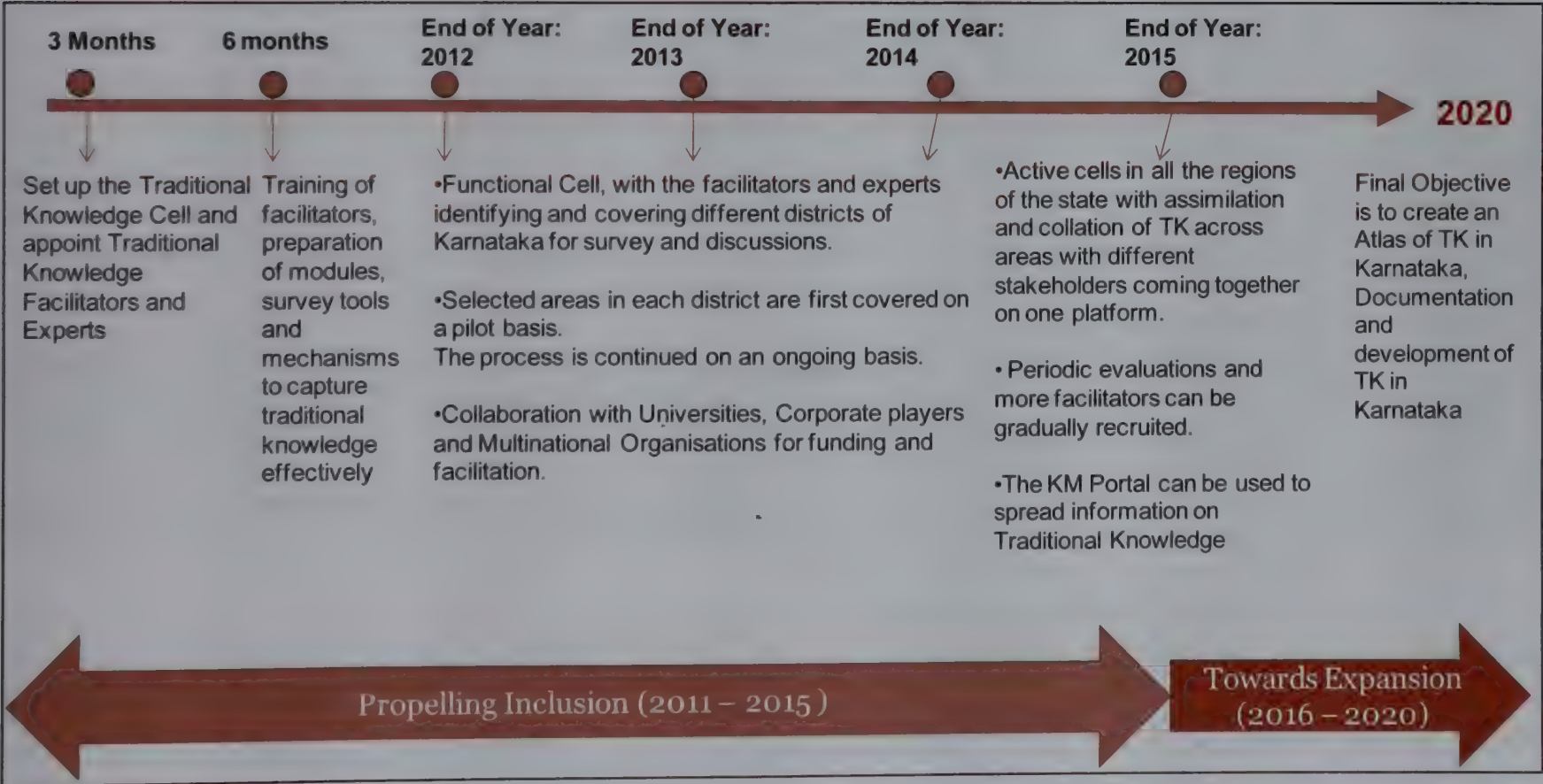
- Outcome
- 1. Improvement in systems for identifying, developing and utilising traditional knowledge.
 - 2. Promotion of research in traditional knowledge.
 - 3. Documentation of traditional knowledge ensuring it can be preserved for generations.

- Particulars
- Follow a district wise ‘Bottom Up’ approach to assimilate information on Traditional Knowledge. Design a Karnataka Traditional Knowledge Atlas (KTKA)⁶³ which details the Indigenous Knowledge for the different regions in the all districts of the State. Steps to be undertaken:
- Set up of a Central Traditional Knowledge Cell which compiles information collected from the different districts of the State.
 - The Cell would appoint 6 Community Facilitators initially where each facilitator can be made in-charge of 5 districts to cover all the districts of the State.
 - The Community Facilitator would be appropriately trained and would make visits to villages to identify Traditional Knowledge Practitioners.
 - These efforts can be undertaken in collaboration with Universities, Corporate players and Multinational Organisations for funding and facilitation.
 - Encourage Research publications on local indigenous knowledge through such collaborations
 - Consideration needs to be given to the concerns and fears of the Traditional Knowledge Practitioners so that they open up to sharing information and get due credit for the same. A decentralised approach where in a Community facilitator interacts with them can help to address this.
 - A map of the district with the areas and clusters of Traditional Knowledge can be compiled based on resource profiling.
 - Government should act as a facilitator in the distribution of the map and Research progress in form of publications on Traditional Knowledge to Industry Players to generate corporate application and demand of Traditional Knowledge. This demand side push is important to ensure sustainability and can also be induced through seminars and forums.

- Similar Experience
- In India:
- One of the examples can be drawn from the state itself as the Centre for Ecological Sciences, IISc, Bangalore in collaboration with several other organizations like Foundation for Revitalization of Local Health Traditions, MS Swaminathan Research Foundation, Tropical Botanical Garden and Research Institute, National Innovation Fund etc, has developed modules for recording traditional knowledge of local bio-resources in a document, called the “People’s Bio-diversity Register” (PBR).
 - Traditional Knowledge Digital Library - A Government of India initiative to establish ‘prior-art’ of Indian medical knowledge systems by documenting classical herbal formulations and their therapeutic uses in a computerized form that can be searched by patent offices world-wide in order to evaluate (and reject) patent claims based on prior-art belonging to the Indian systems of medicine.
 - Honey Bee Network - The Honey Bee Network is a group of individuals, innovators, farmers, scholars, academicians, policy makers, entrepreneurs and non-governmental organizations (NGOs). The Network identifies and provides a voice to creative farmers, artisans and grassroots innovators by supporting, rewarding and facilitating the

⁶³ The concept is drawn from discussions and inputs from Traditional Knowledge Researchers including Dr N. Nandini, Department of Environmental Science (Bangalore University), Prof. M Jayashankara, Mangalore University.

	protection of their work. The Honey Bee' Newsletter, the mouthpiece of the network, is published in seven Indian languages including Kannada. Acknowledging the source of the traditional knowledge, the Newsletter carries stories of local innovations with the consent of the knowledge holder.
Who?	Karnataka Knowledge Commission
How much?	Major Cost Implications of Setting up the Traditional Knowledge Cell: <i>One Time Costs:</i> Set up an office for Traditional Knowledge Cell within KKC. Costs would include furniture, computers and office space with one-time cost of Rs 2 Lakhs assuming rented or Government allocated space. <i>Recurring Costs:</i> The running expenses including electricity, internet usage, maintenance etc would be in the range of Rs 35, 000 per month Human Resource cost for 6 'community facilitator' would be Rs 48, 000 per month. (Rs 8000 per facilitator). Two consultants/experts would cost Rs 80, 000 per month and two support staff would cost Rs 24, 000 per month. There would be further costs depending upon the scale of the activities like training of facilitators, development of modules, etc.
Indicator	<ul style="list-style-type: none">▪ Number of Traditional Knowledge Cells set up in the state and its coverage across districts and blocks.▪ Number of institutions/researchers taking up traditional knowledge research followed by documentation and assimilation of the same.▪ Number of research studies conducted in different areas of traditional knowledge.
Time Phase	Phase I: 2011 -2015; Phase II: 2016 -2020



Tracking Knowledge Outcomes

Knowledge Index

Goal Prepare a Knowledge Index to track indicators measuring knowledge creation, dissemination and application in the different districts of Karnataka.

Component of Knowledge

Knowledge Creation, Dissemination & Application

Outcome

- Enhanced understanding about the process of knowledge creation, dissemination and application and situation of the same in various domains and regions of the State.
- This will help to measure the outcomes of the various schemes and initiatives of the Government by measuring their impact of the societies and communities.
- Focused efforts for promoting transformation of Karnataka into a Knowledge Society.
- Ranking of districts based on the knowledge index score assigned to each of them.

Particulars

- The Index will constitute indicators that will serve as proxy measures for each of the components of knowledge creation, dissemination and application, as identified in the framework for this study.
- The Knowledge Index will help the policy planners in the state to understand Karnataka’s strengths and weaknesses of the different districts of the State.

Why?

The study reveals that small pockets of excellence in knowledge co-exist with absolute ignorance and low level of knowledge and skill amongst a large population in Karnataka.

Transformation of Karnataka into a Knowledge Society would require the majority of the population achieving basic level of education with no disparities amongst them in accessing and using the knowledge as the presence of knowledge is central to theme of any Knowledge Society. A District based Knowledge Index is vital in this respect. The Index is needed to:

- Monitor the progress of Karnataka and to undertake a periodic assessment, a Knowledge Index can be formulated.
- Assess a district’s performance on set parameters for the core sectors
- Identify problems areas and opportunities, providing a basis for increased policy focus or investments as required, to address shortfalls as a knowledge society.

In India:

The National Knowledge Commission has suggested a National Knowledge Index for the Nation.

Globally:

Several studies on Knowledge measurement and Knowledge Index have been undertaken by the World Bank, UNESCO, and Cardiff Metropolitan University etc. These have lead to computation of the Knowledge Assessment Methodology (KAM), World Knowledge Competitiveness Index etc.

There is a need to measure Knowledge in Karnataka to fulfil its Vision for 2020, of transforming into a Vibrant Knowledge Society.

Who?

Karnataka Knowledge Commission

How much?

Major Cost Implications:

Conduct a study involving factor analysis to prepare the Knowledge Index. The cost would be in the range of –30 40 Lakhs.

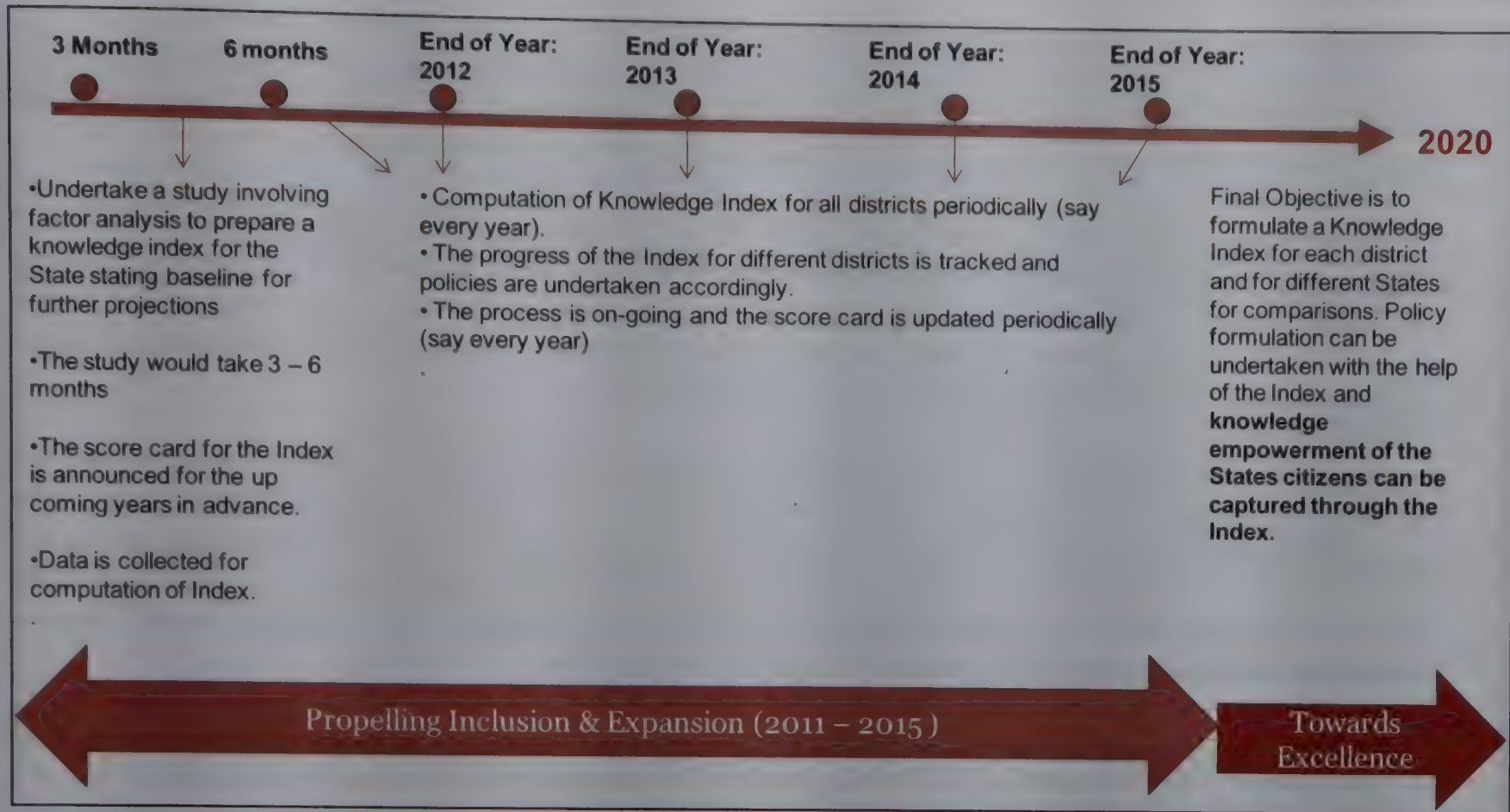
(A possible framework for computing this Index is provided in the following section)

Indicator

- Knowledge Index devised for all districts and state as a whole.
- Track the improvement in score of Knowledge Index from time to time.

Time Phase

Phase I & II: 2011 -2015



As discussed in the last recommendation, it is vital to measure the outcomes and monitor the progress of Karnataka towards achieving the status of Knowledge Society. An index has been proposed here to quantify the creation, dissemination and application of knowledge in the State. Subsequently, measurement and values of some outcome indicators have been obtained through discussions with different stakeholders and secondary data compilation.

D-CAD Index: District wise-Creation, Application and Dissemination Index for Knowledge in Karnataka

In a Knowledge Society focus is explicitly on knowledge as opposed to information, with objectives to create knowledge repositories, improve knowledge access, enhance the knowledge environment, and manage knowledge as an asset. Knowledge Societies are valued on the basis of the knowledge that is created shared and applied within them.

The Knowledge Assessment Methodology – World Bank Index⁶⁴ is one of the major attempts made to capture knowledge in different world economies. The KAM uses both qualitative and quantitative measures to compute the Index, assigning scores to the variables. It considers data on a country wise basis and **ranks the countries** in order of performance for comparison between countries and to measure the progress of the same country over time. On a national level, the introductory paper published by the National Knowledge Commission envisions a National Knowledge Index for India. The NKI is suggested to be based on the indicators selected by the World Bank for KAM including a few other categories like knowledge competitiveness and regional skills assessment.

Both the KAM and NKI have been used as key references to form a Knowledge Index for Karnataka. Based on the objective of building a Knowledge Society in the State the construct of this Index has been focused on measures of Karnataka’s performance in Knowledge Creation, Dissemination and Application making use of both quantitative and qualitative indicators.

⁶⁴ www.info.worldbank.org/etools/kam2005/

The key variants of this Index compared to the KAM or NKI:

- The Index for Karnataka largely measures Creation and Application of Knowledge through effective Dissemination – both formal and traditional. It thus derives its name as the CAD Index
- The Index is based on ‘District focused Approach’ for policy implications and identifications of areas of need for government facilitation and/or intervention. The Index involves computing separate scores for Knowledge Creation, Dissemination and Application for each of the 30 districts of Karnataka which is then averaged out to obtain a State wide score or Index measure. District wise approach is an important aspect of the Index computation hence giving it a D-CAD connotation.
- Knowledge Dissemination and Application data is largely available from the district websites and the ‘District at a Glance’ document that is produced each year. Knowledge Creation measures though are limited to State level and there is a lack of R&D Resource Profiling in the State. This is one of the key recommendations mentioned in this Study and till comprehensive and specific data is not available for the district wise number of PhDs, researchers, R&D expenditure etc we need to rely on qualitative and primary data derived indicators along with quantitative data for computation.
- For Traditional Knowledge as well, one of the key recommendations of this study includes, micro level resource profiling and establishing inter linkages and communications for effective sharing. At present before a knowledge profile and base to measure traditional knowledge quantitatively is constructed, primary data derived indicators have to be resorted to for computing the level of preservation and promotion of Traditional Knowledge in districts of Karnataka

For computation of the DCAD a Score Card Approach is used. The method, variables considered, scores and the possible variants are explained as follows:

Score Card Approach for the Computation of the D-CAD Index

The concept of a score card is drawn from the KAM Index of the World Bank, but instead of ranking the different districts we assign each of the 20 variables listed in the Table below with a Score of 1-5 based on pre determined Score Card (that is updated each year/period for which the Index is computed).

Index for the ‘t’th district is given by:

$$Dt = \sum_{k=1}^{20} Sk / 21, t = 1.....29(\text{no.of districts})$$

Here ‘Sk’ is the Score of the kth variable (k=1...21). The Maximum Value of the Index for Each District under this method would be 5 and the minimum value will be 1. The Overall D-CAD Index for Karnataka is given by:

$$D - CAD = \sum_{t=1}^{29} Dt / 29$$

The Maximum Value of this Index is also 5, which is obtained when all the District wise Indices score 5. The Minimum Value of this Index is 1, when all the District wise Indices score 1.

Indicative list of variables to be considered for computation of the D-CAD Index is as follows:

Table 9: Indicative list of variables considered in the D-CAD Index⁶⁵

District wise Measure	Type	Data Source
1. Pc DGDGP – Per capita District wise Gross Domestic Product in PPP US \$ for the year of measurement	Knowledge Indicator I: Knowledge Application – Overall Economic Development Measure	<p>Economic Development is captured by GDP</p> <p>Source: Directorate of Economics and Statistics can provide information for DGDGP (had previously helped in collecting and classifying income data for calculating Taluk Gross Domestic Product (TGDP) for the State and District specific Human Development Report (2008).</p> <ul style="list-style-type: none"> For converting the GDP into PPP US\$, India wide GDP and India GDP in PPP US\$ data can be used. This is readily available online. Population figures for each district can be taken from the 'District at a Glance' documents
2. Literacy Rate	Knowledge Indicator II: Knowledge Application – Education Measure	<ul style="list-style-type: none"> Indicator of basic Education dissemination in each district District wise literacy rate is available from the Directorate of Economics and Statistics and/or Planning Programme Monitoring & Statistics Department
3. Life expectancy at birth	Knowledge Indicator III: Knowledge Application – Health Measure	<ul style="list-style-type: none"> Indicator of number of years a newborn would live if prevailing patterns of mortality were to remain the same. Measure of basic level health dissemination District wise life expectancy at birth is listed in the Human Development Report for the State, providing methodology and sourced to related computations
4. Employment Rate in Agriculture normalized by District population	Knowledge Indicator IV: Knowledge Application - Sector Measure	<ul style="list-style-type: none"> Measure of labour employability in the agricultural sector Source: Each 'District at a Glance Document', Statistics Office along with the State's Ministry of Labour and Employment.
5. Employment Rate in Manufacturing normalized by District population	Knowledge Indicator V: Knowledge Application - Sector Measure	<ul style="list-style-type: none"> Measure of labour employability in the manufacturing sector Source: Each 'District at a Glance Document', Statistics Office along with the State's Ministry of Labour and Employment.
6. Employment Rate in Trade & Commerce and Other services normalized by District population	Knowledge Indicator VI: Knowledge Application - Sector Measure	<ul style="list-style-type: none"> Measure of labour employability in the Service sector Source: Each 'District at a Glance Document', Statistics Office along with the State's Ministry of Labour and Employment.
7. Researchers in R&D	Knowledge Indicator VII: Knowledge Creation Measure	<ul style="list-style-type: none"> This is based on the statistical score on a 1-5 scale of a large sample group (of universities, district authorities, companies) responding to the question: 'whether researchers engaged in R&D in the district (=nonexistent, 5=intensive and maximum in State). This would contribute to R&D Resource Profiling in the State
8. Expenditure for R&D as a proportion of DGDGP	Knowledge Indicator VIII: Knowledge Creation Measure	<ul style="list-style-type: none"> This is based on the statistical score on a 1-5 scale of a large sample group (of district authorities, service providers) responding to the question whether the expenditure on R&D is (1=minimal or nonexistent, 5=intensive and among State's

⁶⁵ The list of variables is only suggestive in nature and can be altered based on a detailed study of the Index and data availability

District wise Measure		Type	Data Source
			maximum).
9.	University – Company Research Collaboration	Knowledge Indicator IX: Knowledge Creation Measure	This is based on the statistical score on a 1-5 scale of a large sample group (of companies and universities) responding to the question: whether companies' collaboration with local universities in R&D in a district is (1=Non Existent, 5= intensive and maximum in State)
10.	Grass root level collaboration for Research	Knowledge Indicator X: Knowledge Creation Measure	<ul style="list-style-type: none"> This is based on the statistical score on a 1-5 scale of a large sample group (of researchers, universities, Anganwadi workers, Krishi Vigyan Kendras etc, district authorities and end users like farmers, local health practitioners etc, responding to the question: whether the circulation & networking of knowledge between researchers, disseminators and users is (1=Non Existent, 5= intensive and maximum in State)
11.	Drop Out Rate between Primary Education and High School (secondary)	Knowledge Indicator XI: Knowledge Dissemination – Education Measure	<ul style="list-style-type: none"> Indicator of bottlenecks in primary education dissemination in each district District wise enrolment data is available from the 'District at a Glance Document' from the individual district websites
12.	Drop Out Rate between High School and Pre University	Knowledge Indicator XII: Knowledge Dissemination – Education Measure	<ul style="list-style-type: none"> Indicator of bottlenecks in secondary education dissemination in each district District wise enrolment data is available from the 'District at a Glance Document' from the individual district websites
13.	Number of Anganwadi Centres normalized by population	Knowledge Indicator XIII: Knowledge Dissemination – Health Measure	<ul style="list-style-type: none"> Indicator of local dissemination of health practices. District wise data is available in the 'District at a Glance' document
14.	No. of Libraries per 1000 population	Knowledge Indicator XIV: Knowledge Dissemination - ICT Measure	<ul style="list-style-type: none"> Indicator of informal means of knowledge dissemination District wise data can be obtained from the Directorate of Economics and Statistics
15.	Daily Newspapers per 100 people	Knowledge Indicator XV: Knowledge Dissemination - ICT Measure	<ul style="list-style-type: none"> Indicator of informal means of knowledge dissemination District wise data can be obtained from the National Readership Survey website It would be preferred to have data on Newspaper Readership instead of number of Newspapers in circulation but this is subject to data availability.
16.	Number of Mobile connections per 100 people	Knowledge Indicator XVI: Knowledge Dissemination - ICT Measure	<ul style="list-style-type: none"> Indicator of informal means of knowledge dissemination District wise data can be obtained from Individual Service Providers in the State
17.	Internet Subscribers per 1000 people	Knowledge Indicator XVII: Knowledge Dissemination – ICT Measure	<ul style="list-style-type: none"> Indicator of informal means of knowledge dissemination Data can be obtained on a state level from Telecom Regulatory Authority of India Reports. District wise data can be obtained from the same authorities.
18.	District wise number of Traditional Knowledge practitioners related to Biodiversity	Knowledge Indicator XVIII: Traditional Knowledge Creation Measure	<ul style="list-style-type: none"> Data on district wise Traditional Knowledge related to preservation of biodiversity is available in the People's Biodiversity Register maintained by Centre for Ecological Sciences - IISc, Bangalore.

District wise Measure		Type	Data Source
19.	Traditional Knowledge Assimilation	Knowledge Indicator XIX: Traditional Knowledge Assimilation Measure	▪ Qualitative data based on the statistical score on a 1-5 scale of a large sample group (of profiled researchers, district level authorities, traditional knowledge practitioners etc) responding to the question whether the effort to assimilate Traditional Knowledge in the district is (1=minimal or nonexistent, 5=intensive and among State's maximum). This would also contribute to Traditional Knowledge Resource Profiling in the State
20.	Traditional Knowledge Sharing	Knowledge Indicator XX: Traditional Knowledge Dissemination Measure	▪ Qualitative data based on the statistical score on a 1-5 scale of a large sample group (of profiled researchers, traditional knowledge practitioners, companies, industry players etc) responding to the question whether the District Authority efforts to communicate Traditional Knowledge of the district is (1=minimal or nonexistent, 5=intensive and among State's maximum).
21.	Number of Innovative practices and activities undertaken (funded by State Innovation Fund) (e.g. Innovative Schemes, workshops, communication methods etc)	Knowledge Indicator XXI: Innovation Measure	▪ District wise number of activities undertaken under the realm of Innovation (funded by the State Innovation fund). Information can be obtained from the district level government officials.

Indicative Score Card for the D-CAD Index:

The key characteristics of the Score Card include:

- The numerical criteria in the Score Card are based on analysis of latest data available through Secondary data sources. The Score card may need updating each time the Index is computed. Since it would always be a change of scale (and not a change of origin), it will not affect over time Index comparisons.
- The Qualitative Scores(which need primary data collection) are drawn from the World Bank KAM Index computations
- The Criteria range is left inclusive and right exclusive. For example, if a district has Literacy Rate between 0.2 – 0.4 it gets a score of 2. If the district has a literacy rate of 0.4 though it is included in the range: 0.4-0.6

Table 10: The Score Card for the Variables listed in Table 9⁶⁶

Score Card		1	2	3	4	5
No	Indicator					
I	DGDP Per Capita in PPP US \$ for the year of computation	<1500	1500 -2000	2000-2500	2500-3000	>3000
II	Literacy Rate	<0.2	0.2 -.04	0.4-.06	0.6-0.8	.08-1
III	Life expectancy at birth	<50	50 - 55	55 - 60	60 - 65	> 65
IV	Employment Rate in Agriculture normalized by District	<0.2	0.2 -.04	0.4-.06	0.6-0.8	.08-1

⁶⁶ The Scores assigned are only indicative and suggestive in nature

Score Card		1	2	3	4	5
No	Indicator					
	population					
V	Employment Rate in Manufacturing normalized by District population	<0.2	0.2 -.04	0.4-.06	0.6-0.8	.08-1
VI	Employment Rate in Trade & Commerce and Other services (Total employed – Agri – Manufacturing) normalized by District population	<0.2	0.2 -.04	0.4-.06	0.6-0.8	.08-1
VII	Researchers in R&D	Non Existent	Worse than most (70%) districts	Average of all the districts	Better than most (70%) of districts	Intense and maximum in State
VIII	Expenditure for R&D (proportion of DGDP)	Non Existent	Worse than most (70%) districts	Average of all the districts	Better than most (70%) of districts	Intense and maximum in State
IX	University-Company Research Collaboration	Non Existent	Worse than most (70%) districts	Average of all the districts	Better than most (70%) of districts	Intense and maximum in State
X	Grass root level Collaborations	Non Existent	Worse than most (70%) districts	Average	Better than most (70%) of districts	Intense and maximum in State
XI	Drop Out Rate between primary and high school	0.8 - 1	0.6-0.8	0.4-.06	0.2 -.04	<0.2
XII	Drop Out Rate between high school and pre university	0.8 - 1	0.6-0.8	0.4-.06	0.2 -.04	<0.2
XIII	Number of Anganwadi Centres per 10000 of population	0-4	4-8	8-12	12-16	>16
XIV	No. of Libraries per 10000 population	0-1	1-2	2-3	3-4	>4
XV	Daily Newspapers per 100 people	0-5	5-10	10-15	15-20	>20
XVI	Mobile connections per 100 population*	<30	30-50	50-70	70-90	>90
XVII	Internet Subscribers per 1000 population**	<10	10-20	20-30	30-40	>40
XVIII	Indicator for TK Creation -District wise number of Traditional Knowledge practitioners related to Biodiversity***	***	***	***	***	***

Score Card		1	2	3	4	5
No	Indicator					
XIX	Traditional Knowledge Assimilation	Non Existent	Worse than most (70%) districts	Average	Better than most (70%) of districts	Intense and maximum in State
XX	Traditional Knowledge Networking & Application	Non Existent	Worse than most (70%) districts	Average	Better than most (70%) of districts	Intense and maximum in State
XXI	Number of Innovative practices and activities undertaken (funded by State Innovation Fund) (e.g. Innovative Schemes, workshops, communication methods etc)	Non Existent	Worse than most (70%) districts	Average	Better than most (70%) of districts	Intense and maximum in State

**Based on Tele density estimates by TRAI (can be revised if Mobile phone specific data is available). Currently Tele density in Karnataka is 72.83 and National Average is 57.99.*

***Currently there are 27.69 internet subscribers in Karnataka per 1000 population.*

**** Given the practical limitations of measuring TK Creation, we rely on a small section of it as an indication i.e. Biodiversity related TK creation as it is documented through the People Biodiversity Register. In case of Data unavailability we can also rely on Qualitative data, obtained from responses to the question: ‘What % of the TK in the district do you think has been recognized or documented’.*

Possible variants of the D-CAD Index

Subject to data availability and purpose of study, there can be variations in the Basic D-CAD Index to provide district and time phase specific outputs. A few such variants are discussed in details below:

- **Weighted D-CAD Index:** The Basic Index suggested above takes a simple Index Number approach with equal weights assigned to the various Variable or Key Performance Indicators. This is because the D-CAD Index is projected to be largely a knowledge measure and all the indicators of Knowledge Creation, Dissemination and Application hold equal importance in a Knowledge driven economy. As a result the basic model gives the score for each district vis-a-vis the Best case scenario (which encompasses holistic development of the district).

In order to conduct specific studies on different aspects of Knowledge in each district of Karnataka, we can use a modified Index where each of the variables is weighted with appropriately assigned weights. For example if we want to give more importance to the Overall Economic variables of the district, the Pc DGDP Score earned by each district can be given a weight of 1.5 and the other 19 variables can be given a weight of 1 to calculate the Final Score of the District.

- **Cluster based D-CAD Index:** The variables listed above capture the overall performance of each district in the areas of Creation, Dissemination and Application of Knowledge. A further breakdown of the Index might be desired for specific studies, wherein we might want to look at the ‘High performing districts’ and the ‘Low performing districts’ separately. In this case a Cluster based approach can be adopted. For example, some variables which are indicative of Knowledge Creation or the Economic Intense part of the Knowledge Pyramid can be excluded from the Index measurement for the ‘Low performing cluster’ and instead we may include more measures of Knowledge Dissemination like: Number of schools, pupil teacher ratio etc.
- **Time based Index:** The Index measurement requires data collection and analysis for calculating the values of the KPIs or selected variables. There are often time lags in data availability for different variables and different districts of Karnataka.
 - In case of unavailability of current data –simulation based on past data can be undertaken to estimate the variable values for the current year for greater accuracy.

- Moreover, certain data is only computed over long run (for example – Census data) whereas some data is calculated on a yearly basis (District at a Glance document, annual surveys etc). Once we initiate the compilation of data for the Index we might want to segregate it into a Long Term and a Short Term Index. The selected variables that are calculated on a short run basis may give us the value of the Short Run Index and we may have a Long Run Index calculated once every 10 years for example, also including the variables calculated with the help of long term data such as census information.
- **Knowledge Empowerment Index:** Based on the variables/KPIs used to compute the Basic D-CAD Index and additional data collected through primary survey, an index to compute the degree of knowledge empowerment of an average citizen of each of the districts of Karnataka can also be computed. This would be partly based on socio-economic indicators and partly on perceptions and will help to provide a fair picture of the status of knowledge creation, dissemination and application in the districts and its impact on the local community and people.

An Alternative Approach: Regression Analysis can also be used as the basis for formulating an Index for measuring outcomes

Knowledge is a cardinal concept. Measurement of knowledge is essential for decision makers to achieve sustainable development and to progress towards a knowledge society. On the basis of past years' data collected from districts of Karnataka the present state of the knowledge in Karnataka can be analyzed to facilitate comparison between them. The regression analysis that can be adopted to compute an index for knowledge in Karnataka is described as follows:

$$Y_t = X_t \beta + \varepsilon_t$$

Where: Y_t = Knowledge in the 't'th district of Karnataka; t=1...30(no. of districts in Karnataka). Here dependent variable cannot be defined directly as it is abstract and non tangible. But we may use a proxy variable for a specific district as dependent variable. For example, the Per Capita District Gross Domestic Product (Pc DGDP) can be considered as a proxy variable for the dependent variable as it is reflective of the overall socio- economic condition of each district.

X_t = different independent variables for the 't'th district of Karnataka (as listed Nos. 2-20, in Table 7 above). The independent variables can be either quantitative or qualitative in nature. We quantify the qualitative variables by assigning them with scores (similar to the procedure applied in the Score Card Index Calculation - Table 8)

ε_t = White noise, with zero mean and constant variance for the 't'th district of Karnataka

We can apply the least square method to estimate the value of β as: $\beta^* = (x'x)^{-1} x'y$

We estimate the regression equations for each district to compute the value of **Estimated** Y_t or Y^*_t , for all

values of t. The value of the Knowledge Index for Karnataka can be then computed as:
$$Y = \sum_{t=1}^{29} Y^*_t / 29$$

Where Y is the Knowledge Index for the State which is an average of the estimated value of Y_t i.e. Y_t^* for all t.

Conclusion

"Learning gives creativity. Creativity leads to thinking. Thinking provides knowledge. Knowledge makes you great." – Dr A.P.J Abdul Kalam

In the above lines, Dr Kalam envisions a knowledge based India. A national transformation from the present state to a Knowledge Society which entails both a radical improvement in dissemination and application of existing systems of knowledge and creating avenues for generating new forms of knowledge. This in fact forms the objective of the National Knowledge Commission (NKC) (2005), which has brought about a paradigm shift in the outlook towards education, information and knowledge. With the same vision, Karnataka Jnana Aayoga (2008) was set up in Karnataka to bring about convergence of various fields and sectors towards building a knowledge society in the State.

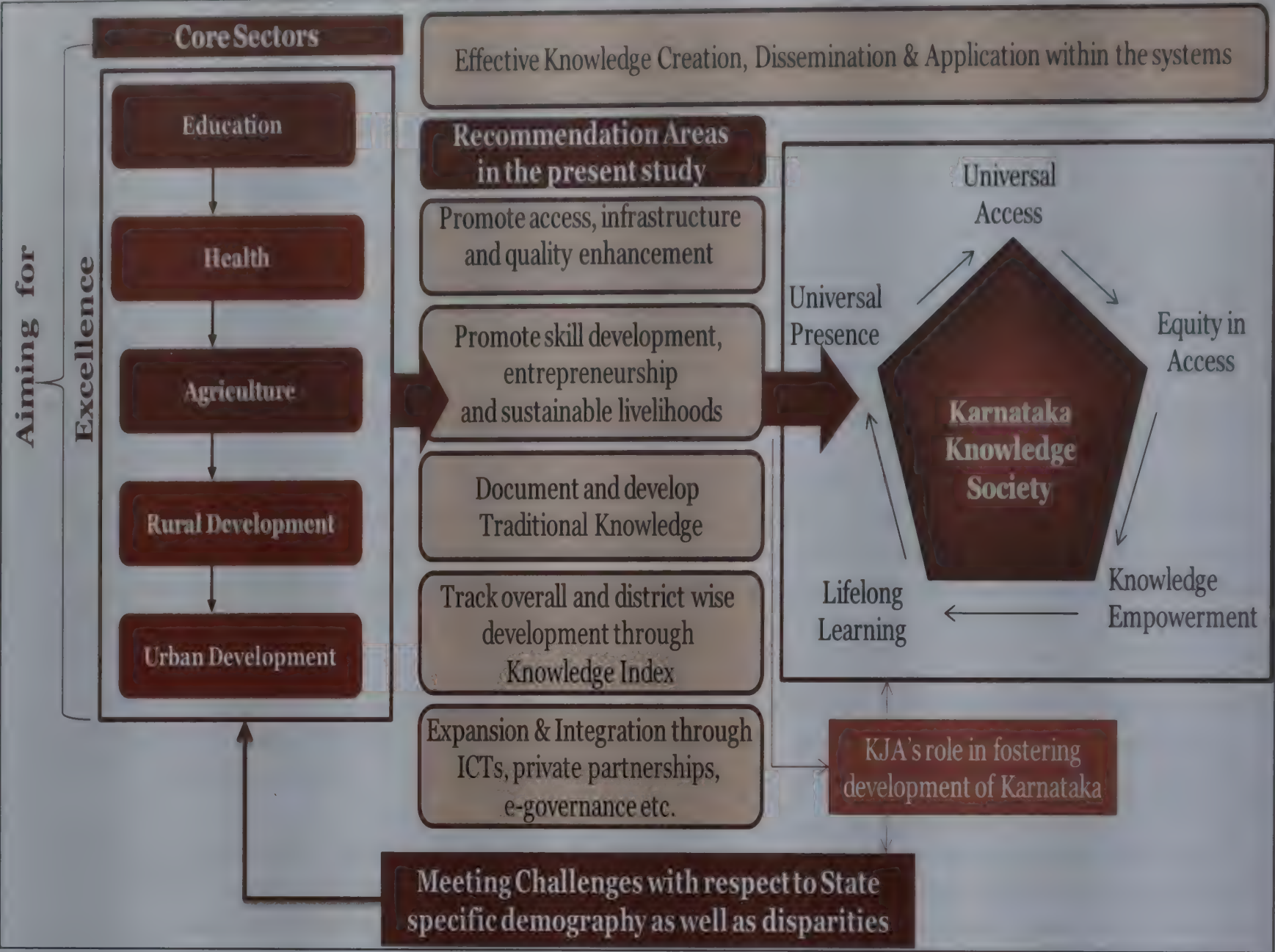
At present the core sectors of the State are facing critical challenges ranging from poor infrastructure and service delivery to a huge upcoming demographic advantage which needs to be appropriately harnessed. To successfully meet these challenges, the recommendations of this study focuses on improving the delivery mechanisms, integration of initiatives and promoting access and opportunity to the State's citizens. KJA plays a significant role in fostering these initiatives which eventually aim for excellence across the various sectors leading to the desired transition towards a Knowledge Society.

Knowledge creation depends on well-functioning markets - where individuals, investors, owners or managers are motivated through rewards which the application of such knowledge brings. Every society has distinctive assets and deficits; ones which understand their comparative advantage and design the policies to exploit the advantages raise the odds of success.

The educated and trained scientists and researchers, world class institutions and facilities facilitate interactions with global communities to generate fresh ideas and new perspectives. These fuel innovations which create commercial success and help transition towards the knowledge based society. Globalisation has accelerated the pace at which skills requirement change, a highly educated workforce is critical to support innovation and transition from industrial to knowledge-based economy and society.

Therefore, initially the challenge for Karnataka in its journey towards a knowledge based society, is not so much in developing world class institutions and trained researchers, but it would be in lifting a large population from relatively disadvantage position and bringing them to a level where they can positively contribute to economy and society. The roadmap developed for the transformation looks to achieve this in three phases – Inclusion, Expansion and Excellence. The recommendations made herein cover the Inclusion and Expansion phases where the focus is to bring the society to a level of threshold knowledge where it is able to find these comparative advantages and pursue them earnestly to attain excellence. The focus areas are depicted in the following diagram.

Figure 37: Conclusive overview of the Study



Annexure I

Research Methodology: Primary Data Collection

The primary mode of assessment in this study was through a survey conducted across various stakeholder groups in the five identified sectors, namely, Health, Education, Agriculture, Rural Development and Urban Development. In addition, secondary sources of information were also utilized to supplement the data obtained from the survey. This section of the report details the research design and methodology adopted for the study.

Design of Survey Instruments/ Questionnaires

- This study involved interactions with three key stakeholder groups – beneficiaries, service providers and researchers/policy makers. Respondents belonged to one of the five sectors to be covered for the study – Health, Education, Agriculture, Rural Development and Urban Development
- For beneficiaries, one generic questionnaire was administered to all respondents across all sectors to which respondents provided sector specific responses.
- For Researchers/ Policy planners, one generic questionnaire was administered for all respondents in this group. While most questions were structured and close ended, there were a few open-ended questions.
- Focus Group Discussions were conducted with beneficiaries and service providers, from each sector under study, in order to elicit more specific information from the stakeholders.

Sample Design

Location selection

Stratification of the sample was done according to the historical-geographical regions in the State – Hyderabad Karnataka, Bombay Karnataka, Coastal and Malnad region, and Southern Maidan. For the selection of the districts within each region, the HDI rankings were used as an indicator. In this study, from each region, the district with the highest and lowest HDI ranking was selected. Eight districts and sixteen taluks were covered during the primary survey⁶⁷:

As seen in the table, the sample included two districts with high overall HDI (rank 1 and 2); three districts with medium HDI (ranks 7, 11 and 18); and three low HDI districts (ranks 23, 25 and 27). Further,

Region	District	Taluk
Bombay Kamataka	Belgaum (8)	Belgaum
		Chikodi
	Bijapur (23)	Bijapur
		Muddebihal
Hyderabad Kamataka	Bellary (18)	Bellary
		Sandur
	Raichur (27)	Raichur
		Manvi
Coastal and Malnad	Dakshin Kannada (2)	Mangalore
		Puttur
	Hassan (11)	Arasikere
		Hole Narsipur
Southern Maidan	Bangalore Urban (1)	Bangalore North
		Bangalore South
	Chamrajnagar (25)	Chamrajnagar
		Kollegal

- In each of the eight districts selected, a total of fifteen locations were covered. Of this 10 were rural and 5 urban locations.
- In each of the eight districts, two taluks were covered through random selection, totalling sixteen taluks across the selected districts.
- In each of the sixteen taluks, five rural and at least two urban locations were covered.

⁶⁷ The respective district HDI ranking are provided in parenthesis

The following table provides a break-up of the survey locations. As can be seen, a total of 115 locations were covered in the survey, of which 70 rural and 45 urban locations. The data shows that 99% of the selected locations had a school (either government or private or both) while 48% had a higher education institute. 73% of the locations covered had a health centre (either government or private or both), while 99% locations had access to electricity and phones (either landlines or mobile). 49% of the locations had access to computers/ internet facilities.

Location Profile of the survey respondents									
District	Taluk	No of locations		No of locations with access to following social infrastructure/ facilities					
District	Taluk	Rural	Urban	School	Higher Education	Health Center	Electricity	Phone	Computer/ Internet
Belgaum	Chikodi	5	2	7	1	7	7	7	2
	Belgaum	5	3	7	4	7	7	7	4
	District Total	10	5	14	5	14	14	14	6
Raichur	Raichur	5	3	8	3	5	8	8	3
	Manvi	5	2	7	3	3	7	7	2
	District Total	10	5	15	6	8	15	15	5
Hassan	Arsikere	6	2	8	2	3	8	8	2
	Hole Narsipura	4	3	7	3	4	7	7	4
	District Total	10	5	15	5	7	15	15	6
Chamrajnagar	C Nagar	4	2	6	3	3	6	6	3
	Kollegal	6	3	9	6	5	9	9	6
	District Total	10	5	15	9	8	15	15	9
Bangalore	N Bangalore	0	5	5	5	5	5	5	5
	S Bangalore	0	5	5	5	5	5	5	5
	District Total	0	10	10	10	10	10	10	10
Bijapur	Bijapur	5	3	8	3	7	8	8	4
	Mudihbihal	5	2	7	2	6	7	7	4
	District Total	10	5	15	5	13	15	15	8
Bellary	Sandur	5	2	7	1	6	7	7	2
	Bellary	5	3	8	1	5	8	8	3
	District Total	10	5	15	2	11	15	15	5
D Kannada	Mangalore	5	3	8	7	7	8	8	5
	Puttur	5	2	7	6	6	7	7	2
	District Total	10	5	15	13	13	15	15	7
Grand Total		70	45	114	55	84	114	114	56

Respondent profile

1230 respondents were covered during the primary survey comprising of direct beneficiaries/ end users, government service providers, private service providers, department functionaries and other stakeholders including civil society representatives and sector experts. The survey covered 1001 beneficiaries, 200 service providers and 30 researchers, academicians and policy planners spread over the 8 districts under study. An average of 200 beneficiaries per sector and 62 respondents per taluk was covered in the study. The following table provides a sector-wise and district wise breakup of the beneficiaries covered in the survey.

District	Taluk	Health	Education	Agriculture	RD	UD	Total
Belgaum	Belgaum	9	13	13	13	13	61
	Chikkodi	8	10	9	11	10	48
Bijapur	Bijapur	27	24	18	19	12	100
	Muddebihal	23	21	12	8	21	85
Bellary	Bellary	12	23	11	12	9	67
	Sandur	14	2	10	12	6	44
Raichur	Raichur	12	17	15	15	19	78
	Manvi	10	5	10	10	6	41
D Kannada	Puttur	3	3	2	13	2	23
	Mangalore	22	22	23	20	11	98
Hassan	Arasikere	11	11	13	12	10	57
	Hole Narsipur	11	11	12	13	15	62
Bangalore	Bangalore North	9	9	20	0	29	67
	Bangalore South	12	11	0	0	18	41
Chamrajnagar	Chamrajanagar	8	7	8	12	7	42
	Kollegal	13	15	25	27	7	87
Total		204	204	201	199	193	1001

- Further, 62% of the respondents were from rural locations and 72% of the respondents were male
- A majority of the respondents were in the age group of 25-59 years. The percentage of respondents belonging to the age groups of 16-24 years, 25-59 years and 60+ years were 16%, 81% and 3% respectively.
- 81% of the respondents belonged to Below Poverty Line (BPL) households and held either Anthyodaya or BPL ration cards. 13% held APL cards and 7% did not have ration cards.
- As seen from the figures below, 22% of the respondents were self employed in agriculture, 22% were students, 16% were unemployed (including housewives), 13% were self employed in non-agriculture, 11% were casual labourers and 8% each were regular salaried and agricultural labourers.
- With respect to the educational qualifications of the respondents, 23% were PUC pass, 20% had studied till high school, and 16% were only lower primary school (LPS) pass, while 15% were higher primary school (HPS) pass. About 9% were not literate and 9% had completed diploma or certificate courses. Only 8% of the respondents had graduate or post graduate degrees.

Figure 38: Occupational status of respondents

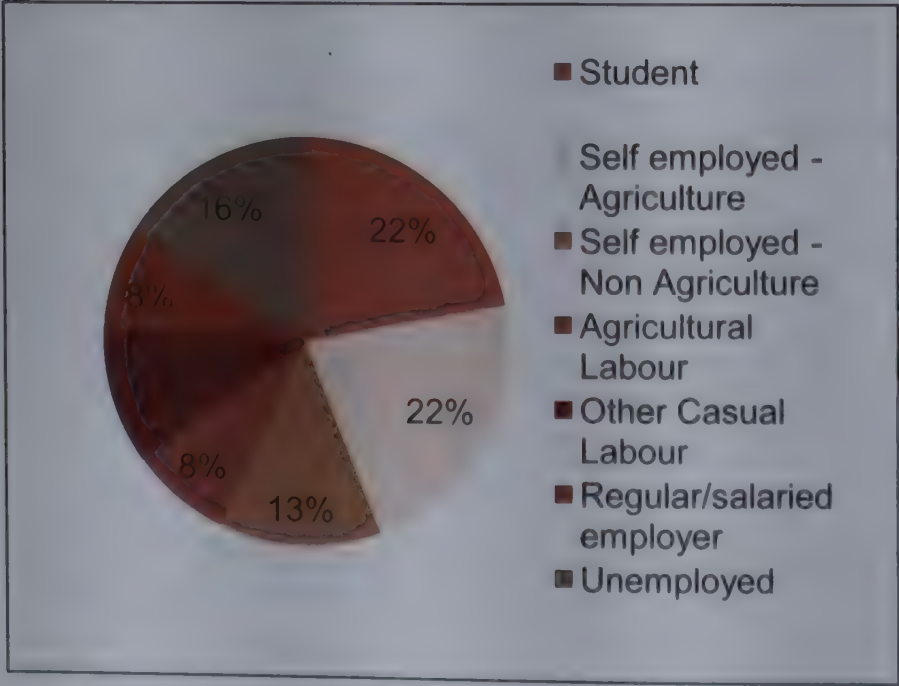
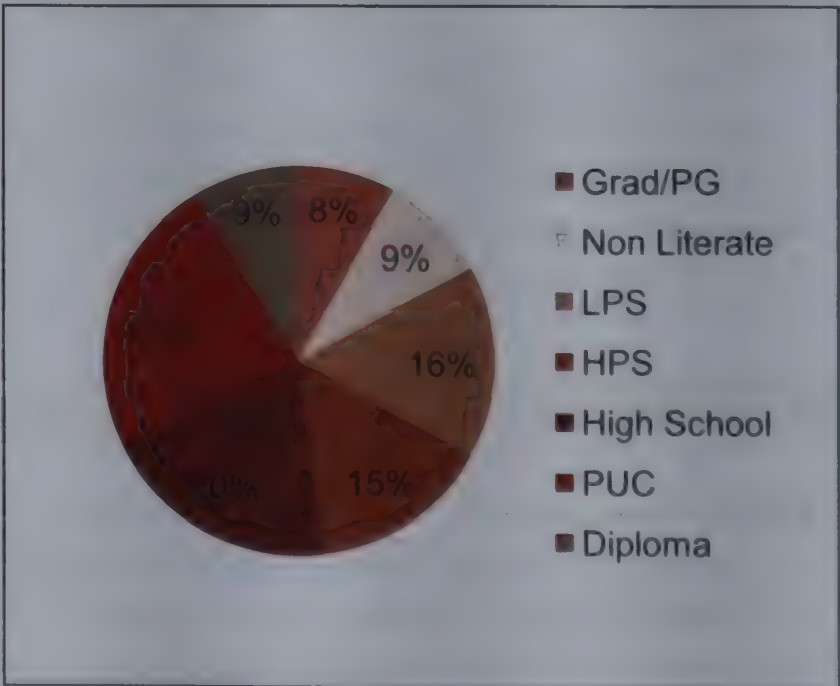


Figure 39: Educational Status of respondents



In addition to demand side stakeholders, about 200 service providers were interviewed belonging to one of the focus sectors. The survey covered service providers from the public sector, private sector and non-government organizations.

At the same time, the team had consultations with researchers, academicians and policy planners to gain insights into their interpretation of a knowledge society for Karnataka and identify the major challenges faced by the state towards its pursuit. The team got in touch with over 60 research and academic institutions across the state and received responses from about 50% of them.

During the course of the study 10 sector specific focus group discussions (FGD) were conducted involving key stakeholders including beneficiaries and service providers. Each FGD comprised of about 10 respondents and was suitably moderated by the survey team. The duration of each FGD was about 1 ½ hours and covered in detail the key aspects of our assessment in each of the five sectors of study. The following table provides details on the 10 FGDs conducted during for the study:

Date	Sector	Stakeholder Group	Location	No of participants
13 July 2010	Education	Beneficiaries	Belgaum	11
13 July 2010	Agriculture	Service Providers	Belgaum	8
14 July 2010	Agriculture	Beneficiaries	Bijapur	
15 July 2010	Rural Development	Service Providers	Raichur	13
16 July 2010	Rural Development	Beneficiaries	Bellary	12
21 July 2010	Health	Service Providers	Chamrajnagar	
23 July 2010	Health	Beneficiaries	Hassan	11
27 July 2010	Urban Development	Beneficiaries	D Kannada	10
31 July 2010	Education	Service Providers	Bangalore	
7 Aug 2010	Urban Development	Service Providers	Bangalore	

The study covered about 200 stakeholders per sector, resulting in a survey size of 1000 beneficiaries. Appropriate representation of various socio-economic groups (including gender, economic status, and social status) and rural-urban areas was ensured. Interactions with selected representatives from NGOs and CBOs as well as from relevant development and sector-specific institutions in the State were carried out. As seen in the table below, 38% of the respondents were from rural areas and 62% from urban. The survey had 72% male respondents and 28% female respondents. A majority of the respondents were in the 25-59 years age group (81%) and belonged to BPL households (81%). The following table provides a snapshot of the respondents profile according to sector

Respondents profile according to sector (only beneficiaries)							
Classification criterion		Health	Education	Agriculture	Rural Development	Urban Development	Total
Location	Urban	41%	33%	16%	3%	100%	38%
	Rural	59%	67%	85%	97%	0%	62%
Gender	Male	54%	67%	94%	75%	70%	72%
	Female	46%	33%	7%	26%	30%	28%
Age Group	16-24 yrs	12%	38%	11%	20%	19%	16%
	25-59 yrs	84%	61%	86%	79%	78%	81%
	60+ yrs	4%	1%	3%	2%	2%	3%
Type of Ration Card	Antyodaya	8%	5%	17%	7%	7%	8%
	BPL	81%	73%	63%	65%	71%	73%
	APL	7%	18%	15%	14%	9%	13%
	None	3%	3%	2%	16%	12%	7%
Total Respondents		204	204	201	199	193	1001

For each of the priority sectors, the survey sought responses from both demand side and supply side stakeholders as described below.

1. **Demand Side:** Beneficiaries of major government schemes and public services. State-wide a total of 1001 beneficiaries were covered in the survey, about 200 per sector.

Health: health sector respondents included beneficiaries of major health sector schemes like RNTCP (TB/ DOTS), NMEP (Malaria), NACP (AIDS/ HIV), pregnant women and lactating mothers, parents of children in the 0-6 age group (recipients of vaccination, polio drops, de-worming, vitamin supplements, monthly health checkups etc), elderly persons. The study also covered patients at private clinics/ hospital and participants of IEC programmes (awareness/ health camps).

Education: education sector beneficiaries included parents of children in primary and secondary school, students in PUC and graduate courses including BA, BSc, BCom, Engineering, Medical and Management. In addition, students at vocational training institutes (Industrial Training Institutes) in courses including garment design (tailoring), electrical domestic appliances, sericulture, computer techniques, automobile mechanic, horticulture, banking, dairying, pre-school education etc were interviewed. The survey also covered students that have dropped out of school/ have discontinued education to capture the potential demand for both formal and informal education in the state.

Agriculture: agriculture sector beneficiaries included farmers (small, medium and large farmers) and farm labourers who may have received government assistance in the form of subsidized or free seeds, fertilizers, pesticides, or farm implements/ machinery. In addition, the study covered members of agricultural cooperatives and farmer organizations. Another category of beneficiaries surveyed are students and researchers at Agricultural Universities in the select districts. A majority of the respondents for this sector were from rural locations.

Rural Development: this category included beneficiaries of various rural development schemes including employment, housing, water and sanitation, watershed management, rural electricity etc. The selection of respondents has ensured a higher coverage of BPL households. Also, the survey covered both male and female respondents. All respondents for this sector will be from rural or semi-rural locations only.

Urban Development: this category included beneficiaries of various urban development schemes including employment and skill development, housing, water and sanitation, etc. The selection of respondents included slum dwellers, lower income housing colonies, middle and higher income households, with a higher coverage of BPL households. The survey also interviewed residents associations in select towns and cities. In addition, the survey covered both male and female respondents. All respondents for this sector will be from urban locations only.

2. **Supply Side:** Service Providers from government departments, private organization and not-for-profit organizations that belong to or are active in the five sectors under study have been covered. State-wide a total of 200 service providers have been interviewed, about 30 per sector. As seen in the table, 65% of the service providers interviewed were from the public sector and 25% belonged to the private sector and NGOs. 89% of the respondents were males and 12% females. The following table provides the sector-wise break-up of the service providers covered in the study:

Profile of service providers										
District	Public	Pvt. & NGO	Male	Female	Agriculture	Education	Health	RD	UD	Total
Belgaum	13%	8%	19%	2%	2%	7%	2%	7%	4%	41
Bijapur	2%	0%	2%	0%	1%	0%	1%	0%	0%	4
Bellary	8%	0%	7%	1%	1%	2%	1%	3%	1%	15
Raichur	14%	4%	16%	2%	2%	5%	2%	7%	2%	34
D Kannada	9%	5%	12%	2%	1%	3%	3%	3%	4%	27
Hassan	7%	6%	11%	2%	1%	4%	2%	6%	0%	25
Bangalore	9%	2%	10%	2%	2%	2%	4%	0%	4%	22
Chamrajnagar	5%	1%	14%	3%	1%	3%	8%	2%	2%	32
Total	130	49	177	23	21	47	45	55	32	200
	65%	25%	89%	12%	11%	24%	23%	28%	16%	

Health: from the government, service providers interviewed included doctors at health centers, Taluk/ District Health Officer, and teaching staff at medical colleges. Private health service providers included private doctors and NGO workers in the health sector.

Education: from the government, service providers interviewed included teachers at government schools, lecturers at colleges and universities, Block Education Officer (BEO) at the taluk level, and Deputy Director of Public Instruction (DDPI) at district level. Among the private service providers in education, faculty members (teachers, lecturers and professors) from private educational institutions have been interviewed.

Agriculture: from the government agriculture service providers, Agricultural Officers or Assistants, government extension workers, and officers at Regional Rural Banks (RRBs) or rural branches of scheduled banks were covered. At the same time, interviews were conducted with faculty members at Agricultural universities. Among the private service providers, interviews with NGO workers and private providers of transportation and warehousing facilities were conducted.

Rural Development: from the government, functionaries at the Gram Panchayat and Zilla Panchayat level were interviewed. In addition, field level officers of major rural development schemes including Mahatma Gandhi National Rural Employment Guarantee Scheme (MNREGA), Sampoorna Grameena Rozgar Yojana (SGRY), Rural Ashraya Housing Scheme, Ambedkar Housing Scheme, Indira Awas Yojana, Bharat Nirmaan Yojana, Swacha Gram Yojana, Rajiv Gandhi Grameen Vidyotikaran Yojana (RGGVY), Pradhan Mantri Grameen Sadak Yojana (PMGSY) etc; were covered. Among private providers, NGO members engaged in rural development were interviewed.

Urban Development: from the government, members of municipal council including city mayors and municipal commissioners were covered. In addition, officers-in-charge of major urban development schemes related to housing, slum development, water and sanitation, and electricity were interviewed. Among private providers, NGO members engaged in urban development and slum rehabilitation were covered.

3. **Researchers, academicians and policy planners** include sector experts, researchers and faculty at research institutions, government department functionaries at the secretariat, and Karnataka Jnana Aayoga members. About 30 researchers and policy planners were interviewed for the study. These interviews were carried out by PwC team members. Annexure 4 lists some of the institutions which were contacted for this study

Quality assurance

To ensure that the quality of field survey is maintained, regular audits and inspections were carried out by field executives and other team members. Periodic status reports were designed to monitor progress and to ensure mid-course corrections. All field teams reported to the field executives on the number of respondents covered on a daily basis. The field executives ensured that any shortfall in the identified quota of respondents to be covered in a district is addressed before the end of survey in the respective districts. At a state level, the weekly data from the field executives was compiled on a weekly basis to ensure that state level quotas are being met.

The following quality assurance steps were undertaken at each stage of the project:

- **Survey instrument design:** Seven separate survey instruments were prepared for this study that were used to record responses from concerned stakeholders. The questionnaire design was primarily based on assessment and research of best practices in survey design, as well as discussions with relevant sector experts to identify key issues and variables. All questionnaires were translated into Kannada. In designing the questionnaire, the following principles of good questionnaire design were adhered to:

The questions were short in simple language throughout the questionnaire;

Clear and simple instructions for completion were given where necessary;

The questionnaire were structured around key themes and were cohesive not disjointed; and

Majority of questions were pre-coded prompted nature (similar to multiple-choice format).

- Pilot testing of instruments: Pilot surveys were conducted by the PwC team to test the survey instruments prepared and the instruments were modified in accordance with the observations made on the field. Pilots were carried out at three locations:
 - Ulsoor, Bangalore where Education and Health service Providers were administered the relevant instruments
 - Rajendra Nagar, Bangalore where the team administered instruments designed for beneficiaries belonging to Health, Education and Urban Development Sectors
 - Devanahalli, Bangalore where the team administer instruments designed for beneficiaries belonging to Health, Education, Rural Development and Agriculture.
- Training for field survey agents: in order to introduce uniformity in the survey data, a full day training session was conducted for 11 field survey team members at the PwC office. The team went through all 7 survey instruments and also completed a small pilot in the Ulsoor area. This session was used to explain the scope and objectives of the project as well as familiarize them with the survey instruments. This interaction with the survey agency allowed us to assess their capabilities and suggest changes to the team composition if any.
- Field visits by core team members to survey locations and for focus group discussions: the team carried out periodic field visits and accompanied the field officers in the field survey. At the same time, at least one PwC team member was present for each of the FGDs with beneficiaries of major schemes and service providers in the select sectors. All discussions were moderated by a trained field level investigator to ensure discussions yielded best results.
- The PwC team carried out interviews with researchers, policy planners and academicians from reputed institutions across the state. They have interacted both in person and through telephone with persons related to over 80 academic and research institutions across the state.
- Design of data base, data entry and cleansing: One of the critical aspects of any survey assignment is maintaining the accuracy of responses received while it is being transferred from the response sheets to the database (for analysis). Our experience is that typically, this vital step is usually susceptible to various errors of omission and commission, wrong interpretation of response, incorrect entry etc. Based on the field-study instrument/ questionnaire, a structured data entry application software in MS-Access was designed. A series of design level steps were taken to increase data integrity during the design phase itself while developing the data entry application software. Additional steps that were taken to reduce time, cost and errors include:
 - Data entry was restricted to few trained personnel;
 - All persons responsible for entering the data were sensitized about the kind of data and adequately trained on it prior to commencement of data entry. Mock data was also entered to enable them to understand the process and clarify doubts, if any.
 - Spot check of data entered was done before finalization of files before being taken into the master database which was the final repository of all survey data.
 - A series of SQL queries were written to check for errors, omissions, inconsistencies.

Annexure II

Scientific & Industrial Research & Development Organizations

Resource Profiling of Karnataka includes making a database of the R&D Institutions in the state of both Industrial and Academic nature. Listed below are Scientific and Industrial R&D Organisations which can act as a reference source for Karnataka Knowledge Commission and other government departments who may like to take the opportunity of initiating interaction with these Institutions which are engaged in R&D in various disciplines. This list has been compiled from myriad sources covering various Departments of Government of Karnataka, **Defence Research and Development Organisation, Department of Scientific and Industrial Research, Council for Scientific and Industrial Research**, etc. Even though all possible care has been taken in compiling the directory of the recognised in-house R&D units, some inadvertent errors cannot be totally ruled out and the list should be considered as indicative in nature.

RECOGNITION No.	NAME AND ADDRESS OF THE FIRM
Agricultural Sciences	
12/90/2006-TU-V	Centre for Natural Biological Resources and Community Development (CNBRCD) #41, RBI Colony, Anand Nagar Bangalore-560024
12/8/88-TU-V	The K.J. Somaiya Institute of Applied Agricultural Research Tal. Mudhol, Distt. Bagalkot, Sameerwadi 587316 (Karnataka)
12/53/96-TU-V	Varanashi Research Foundation Adyanadka - D.K. - 574260, Dakshina Kannada (Dist.) (Karnataka)
Medical	
14/445/2006-TU-V	CBCI Society for Medical Education Johnnagar, Sarjapur Road Bangalore-560034
14/301/99-TU-V	Centre for Human Genetics C/o Jawaharlal Nehru Centre for Advanced Scientific Research, Jakkur P.O. Bangalore 560064
14/412/2005-TU-V * * *	CSI Holdsworth Memorial Hospital Association Holdsworth Memorial Hospital, Post Box No. 38, Mandi Mohalia Mysore-570021
14/368/2004-TU-V	Hope Infertility Clinic and Research Foundation 12, Aga Abbas Ali Road Bangalore - 560042
14/359/03-TU-V	Institute of Bioinformatics Unit 1, Discoverer, 7th Floor International Tech Park Ltd., Whitefield Road Bangalore 560066
14/328/2001-TU-V	Institute of Bio-informatics and Applied Biotechnology G-5, Tech Park Mall, ITPL, Whitefield Road Bangalore - 560066
14/15/88-TU-V	INYS Medical Research Society Jindal Nagar, Tumkur Road, Bangalore 560073

RECOGNITION No.	NAME AND ADDRESS OF THE FIRM
14/429/2006-TU-V	92. Jain Institute of Vascular Sciences Millers Road, Vasanthanagar Bangalore-560052
14/408-A/2005-TU-V	JSS Medical College SS Nagar Mysore-570015
14/105/88-TU-V	Kidwai Memorial Institute of Oncology Hosur Road, Bangalore 560029
14/144/90-TU-V	National Institute of Miner's Health Sri Krishna Rajendra Road, Marikuppam Post, Kolar Gold Field, Karnataka 563119
14/222/93-TU-V	Sanjay Gandhi Accident Hospital & Research Institute Jayanagar East, Byrasandra, Bangalore 560011
14/448/2007-TU-V	Society for Biomedical Technology DEBEL, ADE Campus, New Thippasandra Bangalore-560076
14/264/96-TU-V	Spastics Society of Karnataka 31, 5th Cross, Off-5th Main, Indiranagar, 1st Stage Bangalore 560038
14/43/88-TU-V	Swami Vivekananda Yoga Anusandhan Samsthan, 'Eknath Bhawan' Eknath Bhavan, Gavipuram Circle, KG Nagar Bangalore 560019
14/389/2004-TU-V	Thrombosis Research Institute India, TRI India, 258/A, Bommasandra Industrial Area, Anekal Taluka Bangalore – 560099
Natural and Applied Sciences	
11/389/2000-TU-V	Admar Mutt Education Foundation No.4, Sadashivanagar Bangalore-560080
11/455/2006-TU-V	Advanced Bioresidue Energy Technologies Society Combustion Gasification Propulsion Laboratory, Dept. of Aerospace Engineering, Indian Institute of Science Bangalore-560012
11/43/88-TU-V	4. Aeronautical Development Agency P.O. Box No. 1718, Vimanapura Post, Bangalore 560017
11/407/2001-TU-V	Ashoka Trust for Research in Ecology and the Environment (ATREE) No. 659, 5th A Main Road, Hebbal Bangalore 560024
11/69/88-TU-V	Central Manufacturing Technology Institute Tumkur Road, Bangalore 560022
11/68/88-TU-V	Central Power Research Institute P.B.No.8066, Sir C.V. Raman Road, Sadashiv Nagar Sub Post Office Bangalore 560080
11/280/93-TU-V	Centre for Liquid Crystal Research P.B.No.1329, Prof. U.R. Rao Road, Jalahalli, Bangalore 560013

RECOGNITION No.	NAME AND ADDRESS OF THE FIRM
11/454/2006-TU-V	Centre for Study of Science Technology and Policy No.547, 9th Cross. J.P.Nagar Phase-III Bangalore-560078
11/393/2000-TU-V	Centre for Wildlife Studies 403, Seebo Apartments, 26-2, Aga Abbas Ali Road Bangalore-560042
11/357/89-TU-V	Current Science Association P.Box No. 8001, C.V. Raman Avenue, Sadashivanagar P.O., Bangalore 560080
11/384/2000-TU-V	Foundation for Revitalisation of Local Health and Traditions # 74/2, Jarakabande Kaval, Post: Attur via Yelahanka Bangalore 560064
11/143/89-TU-V	Government Tool Room and Training Centre Rajaji Nagar, Industrial Estate, Bangalore 560044
11/107/88-TU-V	Indian Academy of Sciences P.B.No. 8005, C.V. Raman Avenue, Sadashivnagar Bangalore-560080
11/101/88-TU-V	Indian Plywood Industries Research and Training Institute Post Bag No. 2273, Tumkur Road, Bangalore 560022
11/369/99-TU-V	International Institute of Information Technology 26/C, Electronics City, Hosur Road, Bangalore 560100
11/180/90-TU-V	Jawarharlal Nehru Centre for Advanced Scientific Research Jakkur Campus, Jakkur P.O., Bangalore 560064
11/63/88-TU-V	Karnataka State Sericulture Research & Development Institute Thalaghattapura, Bangalore 560062
11/283/93-TU-V	LPG Equipment Research Centre Opp. ITI Main Gate, Doorvani Nagar, Old Madras Road Bangalore 560016
11/224/91-TU-V	National Institute of Advanced Studies Indian Institute of Science Campus Bangalore 560012
11/120/88-TU-V	National Institute of Rock Mechanics Champion Reefs, P.O. Kolar Gold Fields 563117 (Dist. Kolar)
11/85/88-TU-V	Raman Research Institute C.V. Raman Avenue, Sadashivanagar Bangalore 560080
11/368/99-TU-V	Society for Innovation and Development Innovation Centre, Indian Institute of Science Bangalore 560012
11/14/88-TU-V	Vittal Mallya Scientific Research Foundation Karnataka State, Contractor Association Building, 1/1, New High School Road, Off. K.R. Road, P.B.No.406 Bangalore 560004

RECOGNITION No.	NAME AND ADDRESS OF THE FIRM
Social Sciences	
13/114/91-TU-V	Indian Institute of Management Bannerghatta Road, Bangalore 560076
13/68/88-TU-V	Ved Vignan Mahavidya Peeth No. 19, 39th 'A' Cross, 11th Main, 4th 'T' Block, Jayanagar Bangalore 560041
Academic Institutions	
11/169/90-TU-V	Indian Institute of Science Science Institute P.O., Bangalore 560012
11/195/90-TU-V	Mangalore University Mangalagangotri Mangalore - 574100
11/147/88-TU-V	National Institute of Technology, Karnataka Surathkal P.O. Srinivasanagar-575025 (Karnataka)
11/294/93-TU-V	R&D Centre for Clay Roofing Tiles, Bricks and Other Ceramic Products C/o National Institute of Technology Karnataka, Surathkal, P.O. Srinivasnagar -574025, Dist. Dakshina Kannada (Karnataka)

Compiled List of Aeronautical Development Institutions

Name of Aeronautical Development Institutions and their Location
Center for Artificial Intelligence & Robotics (CAIR), Bangalore
Center for Military Airworthiness & Certification (CEMILAC), Bangalore
Centre for Air Borne Systems (CABS), Bangalore
Defence Avionics Research Establishment (DARE), Bangalore
Defence Bio-Engineering & Electro Medical Laboratory (DEBEL), Bangalore
Defence Food Research Laboratory (DFRL), Mysore
Electronics & Radar Development Establishment (LRDE), Bangalore
Gas Turbine Research Establishment (GTRE), Bangalore
Microwave Tube Research & Development Center (MTRDC), Bangalore

Annexure III

Compiled List of Higher Educational Institutes and Universities in Karnataka

The following indicative list of educational institutions has been compiled from various sources through intensive research. Although, it is a sincere attempt to make a comprehensive list, some institutions could have possibly been omitted due to lack of availability of single compiled list. In this context, the Karnataka Knowledge Commission can undertake steps to build a comprehensive list and keep updating the list on a single Knowledge Management Portal on a regular basis.

Region	District	Name of the Institute/University
Hyderabad Karnataka	Bidar	Bidar Institute of Medical Sciences
		Karnataka Veterinary Animal and Fisheries Sciences University
		Veterinary College
	Gulbarga	Gulbarga University
		Khaja Banda Nawaz Institute of Medical Sciences
		H.K.E. Society's Mahadevappa Rampure Medical College
		Nutan Vidyalaya Society
		Sharanabasaveshwar Vidhya Vardhak Sangha
		Hyderabad Karnatak Education Society
	Raichur	University of Agricultural Sciences, Raichur
		Laxmi Venkatesh Desai College
		College of Agriculture
		College of Agricultural Engineering
	Bellary	Kannada University
		Veerashaiva Vidyavardhaka Sangha
Bombay Karnataka	Bijapur	BLDE University
		Karnataka State Women's University
		BLDE Association's Arts and Commerce College for Women
	Belgaum	Visvesvaraya Technological University
		KLE University
		Lingaraja Mahavidyalaya
		Rani Lakhamgowda Law College
		Kankanwadi Ayurvedic Mahavidyalaya
		Karnatak Lingayat Education Society
		Jawaharlal Nehru Medical College
	Hubli	Karnatak Law Society
		Regional Medical Research Centre
		Kittur Rani Channamma College of Horticulture, Arabhavi
		B.V.Bhoomaraddi College of Engineering and Technology
		Karnataka Institute of Medical Sciences (KIMS)

Region	District	Name of the Institute/University
	Dharwad	University of Agricultural Sciences, Dharwad
		Karnatak University
		Karnataka College
		Kittel Arts College
		SDM College of Dental Sciences and Hospital
		College of Agriculture
		College of Rural Home Science
	Gadag	Kannada Research Institute
	Haveri	
	Uttara Kannada	College of Forestry, Sirsi
	Bagalkot	BVV Sangha's S.Nijalingappa Medical College
		Regional Research Station Of Sugarcane Breeding Institute
South Karnataka (Coastal Karnataka)	Dakshina Kannada/ Mangalore	Mangalore University
		National Institute of Technology, Suratkal
		Yenepoya University
		University Constituent College
		St. Aloysius College
		Kasturba Medical College
		St.Agnes College
		Vijaya College
		NMAM Institute of Technology, Nitte
		National Research Centre for Cashew (NRCC)
	Udupi	Manipal University
		Mahatma Gandhi Memorial College
		Kasturba Medical College (KMC), Manipal
		Manipal Institute of Technology
	Kodagu	Coorg Institute of Dental Sciences
		Indian Institute of Spices Research, Karnataka
	Chikmagalur	
	Shimoga	Kuvempu University
		Sahyadri College, Shimoga
	Hassan	
Maidan Karnataka	Mysore	Mysore University
		Karnataka State Open University
		ANS-State Institute of Rural Development
		State Institute for Urban Development (SIUD)
		Administrative Training Institute (ATI)
		BVV Sangha's S.Nijalingappa Medical College
		Maharaja College
		Government Ayurveda Medical College

Region	District	Name of the Institute/University
		Yuvuraja College
		Sri Krishnarajendra Silver Jubilee Technological Institute
		St.Philomena's College
		JSS Medical College
		Teresian College
		Jagadguru Sri Shivaratreeshwara Mahavidyapeetha
		National Institute of Engineering
		Central Food Technological Research Institute (CFTRI)
		Karnataka Engineering Research Station (K.E.R.S.)
		All India Institute of Speech and Hearing
	Mandya	JSS Ayurveda Medical College
		Central Sericultural Research & Training Institute (CSRTI)
		Adichunchanagiri Institute of Medical Sciences
	Kolar	Mandya Institute of Medical Sciences
		Sri Devaraj URS Medical College
		First Grade College
	Tumkur	Government College for Boys
		Tumkur University
		Sri Siddhartha Education Society
	Chamrajanagar	Sree Siddaganga Education Society
	Davangere	JJM Medical College
		S.S Institute of Medical Sciences& Research Centre
		Bapuji Educational Association
		University B.D.T College of Engineering
		College of Fine Arts
	Chitradurga	Basaveswara Medical College and Hospital
	B'lore Rural	
	Ramanagaram	
	B'lore Urban	University of Agricultural Sciences, Bangalore
		Bangalore University
		Rajiv Gandhi University of Health Sciences
		National Law School of India University
		Bangalore Medical College
		Sri Sathya Sai Institute of Higher Medical Sciences
		RajaRajeshwari Medical College & Hospital
		M.S. Ramaiah Medical College
		Vydehi Institute of Medical Science & Research Centre
		M V J Medical College and Research Hospital Channasandra
		Dr. Ambedkar Medical College Kadugondanahalli,
		Central College
		Regional Institute of Ophthalmology and Minto Ophthalmic

Region	District	Name of the Institute/University
		Hospital attached Bangalore Medical College
		University Visvesvaraya College of Engineering
		Maharani College for Women
		Christ University
		Sri Jagadguru Renukacharya College
		National Education Society of Karnataka
		B.M.S. College of Engineering
		Mount Carmel College
		University Law College
		Government Ramnarayan Chellaram College of Commerce
		Smt.V.H.D Central Institute of Home Science
		Mysore Education Society
		Government Tool Room and Training Centre
		Karnataka Chitrakala Parishath
		Government Unani Medical College
		Rashtreeya Shikshana Samiti Trust (RV College)
		NMKRV College for Women
		Peoples Education Society
		St. John's Medical College
		Karnataka Institute of Medical Sciences (KIMS)
		Seshadripuram Educational Trust
		Acharya Pathashala Educational Trust
		University College of Physical Education
		Agriculture College (UAS)
		Indian Institute of Astrophysics
		Central Power Research Institute (CPRI)
		Centre for Interdisciplinary Studies in Environment and Development (CISED)
		Indian Statistical Institute, Bangalore Centre
		Institute of Bioinformatics
		Institute of Bioinformatics & Applied Biotechnology (IBAB)
		Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR)
		National Aerospace Laboratories
		National Centre for Biological Sciences (NCBS)
		R.V. Centre for Cognitive Technologies
		Raman Research Institute (RTI)
		Indian Space Research Organization (ISRO)
		Centre for Soft Matter Research (formerly Centre for Liquid Crystal Research)
		Karnataka Environment Research Foundation
		Bangalore Medical College and Research Institute
		Foundation of Revitalization of Local Health Traditions (FRLHT)

Region	District	Name of the Institute/University
		Centre for Public Policy, Indian Institute of Management
		Indian Institute of Management Bangalore
		Karnataka Cancer Therapy and Research Institute
		Kidwai Memorial Institute of Oncology
		National Institute of Mental Health and Neuro Sciences (NIMHANS)
		Sri Jayadeva Institute of Cardiovascular Sciences & Research
		St. John's Research Institute (Nutrition Centre of St.Johns)
		Swami Vivekananda Yoga Anusandhana Samsthana (S-VYASA)
		Central Institute of Indian Language
		Indian Institute of Science (IISc)
		Institute of Social and Economic Change
		Jawaharlal Nehru Centre for Advanced Scientific Research
		National Centre for Biological Sciences (part of Tata Institute for Fundamental Research)
		National Institute of Advanced Studies (NIAS), Bangalore
		Population Research Centre
		Institute for Social and Economic Change (ISEC)
		Tata Institute of Fundamental Research
		Indian Institute of Horticultural Research
		Institute Wood Science and Technology (IWST)
		Indian Veterinary Research Institute
		National Dairy Research Institute (NDRI)
		National Institute of Animal Nutrition & Physiology
		Rural Development Institute
		National Research Development Corporation (NRDC)
		Ashoka Trust for Research in Ecology and the Environment
		Environmental Management & Policy Research Institute
		Centre for Mathematical Modelling and Computer Simulation (CMMACS)
		Indian Institute of Horticulture Research (IIHR)
		Indian Plywood Industries Research and Training Institute
		National Institute of Unani Medicine

Compiled List of Unani Colleges in Karnataka

Name	Address
Government Unani Medical College	No. 6, Appareddy Complex Near Corporation Bank, Mysore Road, Bangalore 560026 (Kar.)
H.M.S. Education Society' Unani Medical College	Shetty Hill Road, Tumkur 572102 (Kar.)
Luqman Medical College & Hospital	B.L. Jaradu Campus, 12, Naubag, Bijapur 586101 (Kar.)
National Institute of Unani Medicines	Magadi Road, Bangalore 560090 (Kar.)
Prakruthi Jeevan Kendra	8th Cross, Malleswaram, Bangalore (Kar.)
Secab Association's Luqman Unani Medical College	No. 12, Haubagh, Bijapur 586101 (Kar.)

Name	Address
Tipu Sulthan Shaheed Education Trust's Unani Medical College	Post Box No.99, Opp. Govt. Milk Dairy, Humanbad Road, Gulbarga 585104 (Kar.)
Valley View of International Health Club	Munipal (Kar.)

Compiled List of Ayurvedic Colleges in Karnataka

Name	Address
ALN Rao Memorial Ayurved Mahavidyalaya	Koppa, Distt.Chikamgalore – 577126 (Karnataka)
Amrutha Ayurved Medical College	Behind Onake Obbana Stadium, Devangere
Ashwini Educational Associations Ayurved College	1851/33, Anjaneya Layout, Davangere-577004(Karnataka)
AV Samiti's Ayurved Mahavidyalaya	Murankeri, Bijapur-586101(Karnataka)
Ayurved Mahavidyalaya, (CET Karnataka, College Code 728)	Heggari Extension, Old Hubli-580024(Karnataka)
Ayurved Mahavidyalaya, (CET Karnataka, College Code 735)	Bagalkote Road, Vidonagar, Bijapur-586101
Bapuji Ayurvedic Medical College	Rajendra Nagar, Main Road,Shimoga.
Bapuji Ayurvedic Medical College	Challakere, Distt. Chitradurga – 5775212(Karnataka)
Bhagawan Mahavir Jain Ayurved Medical College	Gajendragarh-582114, Distt. Gadag(Karnataka)
B.M. Kankanawadi Ayurvedic Medical College	Address :Shathapura Belgaum
D.G.Melmalagi Ayurveda Medical College	Kalasapura Road, Shivananda Nagar, Gadag-582103
Dr. BNM Rural Ayurved Medical College & Hospital	College Road, Bijapur-586101(Karnataka)
Dhanwantari Ayurved College& Hospital	P.O. Siddhapur-581355,Distt.North Canara (Karnataka)
Goverment Ayurvedic Medical College	Dhanwantri Road, Bangolore-9
Govt. Ayurved Medical College & Hospital	Mysore-570021(Karnataka)
Govt. Taranath Ayurved College (CET Karnataka, College Code 750)	Anantapur Road, Bellary-583101(Karnataka)
JSS Ayurved Medical College	Mysore-570015(Karnataka)
Karnataka Liberal Education Society Shri BM Kankanadi Ayurved Mahavidyalaya	Shahapur, Belgaum-590003(Karnataka)
Kalmathada Pujya Shri Virupaksha Sivacharya Ayurved Medical College	Manvi, Distt. Raichur-584123(Karnataka)
Kannada Balag Society's Rural Ayurved Medical College	Ram Nagar, Belgaum-590010 (Karnataka)
Kalidas Ayurvedic Medical College	Banashankari Road,Badami-587201
KVG Ayurved Medical College & Hospital	Kurunji Bagh, Sulliya, Dakkshin Kannada
Mahaganpati Ayurvedic Medical College	Distt. Dharwad (Karnataka)
Muniyal Institute of Ayurvedic Medical Sciences	34-C, Shivally Industrial Area, Manipal(Karnataka)
NK Jabashetti Ayurved Medical College	Siddharudh Math, Manhalli Road, Bidar
Rural Education Trust's Ayurvedic Medical College	Koppal-583231,Distt. Raichur(Karnataka)
Rajiv Gandhi Education Society's Ayurvedic Medical College	Ron-582209 (Karnataka)

Name	Address
SDM College of Ayurveda	Hassan-573201(Karnataka)
Shri Basaveshwar Vidya Vardhak Sangha Ayurved Medical College	Distt. Bagalkot-587101 (Karnataka)
Shri Bhartesh Vidya Mandal Gramin Ayurved College	Tq. Jamkhandi, Terdal-587315, Distt. Bagalkot (Karnataka)
Shri DGM Ayurved Medical College	Distt.Gadag-582118 (Karnataka)
Shri DM College of Ayurved (CET Karnataka, College Code 719)	Udupi-576 101(Karnataka)
Shri Guru Valmiki Maharishi Ayurved Medical College	Jaglur Town-577501 Distt. Chitradurga(Karnataka)
Shri Hingulambika Education Society's Ayurvedic College	Maktampura,Gulbarga-585101(Karnataka)
Shri JG Cooperative Hospital, Ayurved Medical College	Ghataprabha, Distt. Belgaum-591321(Karnataka)
Shri SBS Ayurved Medical College	Mundargi, Distt.Gadag-582118 (Karnataka)
Shri Sivayogeshwar Rural Ayurvedic Medical College	Inchal-591121, Tq.Saundatti, Distt. Belgaum (Karnataka)
Shri Vijay Mahantesh Ayurvedic Medical College	P.B. No.15, Ilkal, Distt.Bagalkot-587125(Karnataka)
SNVV Samasthe's SGV Ayurved Medical College	Bailhongal-591102, Distt. Belgaum (Karnataka)
SS Ayurvedic Medical College	Distt.Haveri-581110(Karnataka)
TAME Society's Ayurved Medical College	Sankalapur, Tanda, Bellary Road, Hospet
TAME Society's Ayurved College	Dhanwantari Campus, Halejedikatte, Bhadrawati
Taluka Shikshana Prasarak Sahakara Mandal Ayurvedic Medical College	Sindhagi-586128 Distt.Bijapur (Karnataka)
Veerpulikeshi Vidyavardhak Samasth's Rural Ayurved Medical College & Research Centre	Badami-587201 Distt. Bagalkot(Karnataka)

Annexure IV

Compiled List of In-house R&D Units recognised by the Department of Science & Industrial Research (Ministry of Science & Technology)

Over the years a strong science & technology infrastructure has been established in the country including national laboratories, specialized research centres, various R&D and academic institutions, training centres and others. Several fiscal incentives and other support measures have been provided which encourage and make it financially attractive for industrial units to establish their own in-house R&D units. One such scheme for granting recognition to in-house R&D units in industrial sector was started in 1973. The scheme is being operated by the **Department of Scientific & Industrial Research (DSIR)** in the Ministry of Science & Technology. The following table is an attempt to collate and profile various In House R&D Units in Karnataka recognised by the Ministry of Science and Technology (Source: DSIR website, www.dsir.gov.in)

This list has been prepared by referring to various sources related to the Department of Science & Industrial Research and by seeking inputs from experts. However, it must be observed that this is merely an indicative list and is based on the data available for 2008-09.

Recognition No.	Name and Address of the Firm with In-House R&D Unit registered
TU/IV-RD/371	ABB Ltd. Khanija Bhawan, 2nd Floor, East Wing, 49, Race Course Road, Bangalore - 560001
TU/IV-RD/1727	Ace Designers Ltd. Plot No. 533, X Main Road, Phase - IV, Peenya Industrial Area Bangalore -560 058
TU/IV-RD/1349	Acumac Machine Tools (P) Ltd. 472 A, 12th Cross, Phase IV, Peenya Industrial Area, Bangalore -560 058
TU/IV-RD/1312	Anglo-French Drugs & Industries Ltd. 41, 3rd Cross, SSI Area, Block No. 5, Rajaji Nagar Bangalore -560010
TU/IV-RD/2730	Arunodaya Seeds Company No.1432, 1st Floor, 1st Main, 3rd Cross, Nehru Nagar, Yelahanka, Bangalore-560064
TU/IV-RD/2153	ASL Advanced Systems Pvt. Ltd. (Formerly Aerospace Systems Pvt. Ltd.) "Pragathi", 70/1, Miller Road Bangalore - 560052
TU/IV-RD/2397	Autoliv IFB India Private Ltd. #16, Visveswaraiah Industrial Area, Off Whitefield Road, Mahadevapura Post, Bangalore-560 048
TU/IV-RD/2004	Avasarala Tungsten Ltd.
TU/IV-RD/2440	No. 47, 36th Main, Dollars Scheme BTM Layout Bangalore - 560 076

Recognition No.	Name and Address of the Firm with In-House R&D Unit registered
TU/IV-RD/2269	Bal Pharma Ltd. 21-22 Bommasandra Industrial Area, Bangalore-562 158
TU/IV-RD/1956	Bangalore Integrated System Solutions (P) Ltd. 41-A, 1st A Cross AECS Layout II Stage; Bangalore- 560094
TU/IV-RD/471	Bharat Earth Movers Ltd. BEML Saudha, 23/1, IVth Main, S.R. Nagar Bangalore - 560 027
TU/IV-RD/1211	Bharat Electronics Ltd. Corporate Office, Nagavara, Outer Ring Road Bangalore -560 045
TU/IV-RD/2680	Bharat Electronics Ltd. Outer Ring Road, Nagavara, Bangalore-560045
TU/IV-RD/1100	Bharat Fritz Werner Ltd. Off Tumkur Road Bangalore- 560022
TU/IV-RD/2547	Bharavi Laboratories (P) Ltd. #17, 44/3, Kanakapura Road Bangalore-560062
TU/IV-RD/2481	Bhat Bio-Tech India (P) Ltd. No.47, 38th Main, 6th Cross, B.T.M. Layout II Stage, Bangalore-560100
TU/IV-RD/2621	Bigtec Pvt. Ltd. J.K. Towers, Jayanagar 8th Block Bangalore-82
TU/IV-RD/2814	Bio Organics & Applied Materials Pvt. Ltd. B-64/1, III Stage Peenya Industrial Area, Peenya Bangalore - 560 058
TU/IV-RD/1118	Biocon Ltd. (Formerly Biocon India Ltd.) 20th K.M., Hosur Road, Dist. Bangalore Electronic City-560100
TU/IV-RD/2690	Biovel Life Sciences P. Ltd. 3922, 13th A Cross 9th Main, Banashankari, 2nd Stage, Bangalore - 70
TU/IV-RD/154	Bosch Ltd. Post Box No.3000, Hosur Road Aduodi Bangalore -560 030
TU/IV-RD/2010	BPL Engineering Ltd. 17th K.M. Old Madras Road, Avalahalli, Virgo Nagar, Bangalore-560049

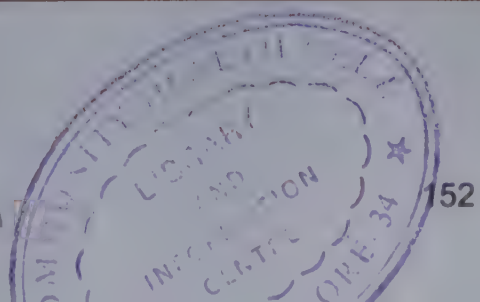
Recognition No.	Name and Address of the Firm with In-House R&D Unit registered
TU/IV-RD/151	BPL Limited 64, Church Street, Dynamic House, Bangalore - 560 001
TU/IV-RD/1440	BPL Techno Vision Pvt. Ltd. 17th K.M, Old Madras Road, Avalahalli, Bangalore -560049
TU/IV-RD/428	BPL Telecom Private Ltd. # 20/1, 11th KM, Bannerghatta Road, Arakere, Bangalore-560076
TU/IV-RD/301	Britannia Industries Ltd. Britania Gardens, Vimanapura, Airport Road Bangalore-560 017
TU/IV-RD/1918	Cadila Healthcare Ltd. Zydus Tower, Opp. Iskcon Temple Satellite Cross Roads Ahmedabad - 380 015
TU/IV-RD/2655	Charoen Pokphand Seeds (India) Pvt. Ltd. 1021/1, Service Road, Geetanjali Layout, H.A.L. III Stage, New Thippasandra, Bangalore-560075
TU/IV-RD/31	Cipla Limited Mumbai Central Mumbai -400 008
TU/IV-RD/2650	Crane Software International Ltd. 4th Floor, Block I, Shankaranarayana Building, MG Road, Bangalore-560001
TU/IV-RD/2642	Customised Technologies (P) Ltd. # 82 B, Electronics City, Bangalore-560100
TU/IV-RD/2121	Dynamatic Technologies Ltd. Dynamatic Park, Peenya Bangalore -560 058
TU/IV-RD/2601	Easun Reyrolle Ltd. Plot No.98, Sipcot Indl. Complex, Hosur-635126, TN
TU/IV-RD/2354	ECL Agrotech Ltd. No. 101, Varsha Apartment 221/224, Sir C.V. Raman Road, RMV Extension Bangalore - 560 080
TU/IV-RD/1776	EID Parry (India) Ltd. Dare House, PB No.12 Chennai- 600001
TU/IV-RD/1601	Electro Systems Associates Pvt. Ltd. 4215, J.K. Complex; First Main Road; Subramanyanagar, P.O.No. 2139 Bangalore- 560021

Recognition No.	Name and Address of the Firm with In-House R&D Unit registered
TU/IV-RD/1332	Electronic Automation Pvt. Ltd. 20, K.H.B Industrial Area, Yelahanka, Bangalore- 560064
TU/IV-RD/146	EMEelectronix Pvt. Ltd. 158, 3rd Main Industrial Town; Rajaji Nagar, Post Box No.4444 Bangalore- 560 044
TU/IV-RD/1508	Enercon Systems Pvt. Ltd. 44-P electronic City Phase - II Hosur Road Bangalore -560 100
TU/IV-RD/2826	Enzene Biosciences Pvt. Ltd. #473, D2, 13th Cross, IV Phase Peenya Industrial Area Bangalore - 560 058
TU/IV-RD/2204	Eureka Forbes Ltd. Konkan Co-Op. Hsg. Soc. Ltd., Plot No.123, Lt. P.K. Marg, Mahim (W), Mumbai-400016
TU/IV-RD/2182	Fosroc Chemicals (India) Pvt. Ltd. 41st KM, NH-4, Tumkur Road, Kuluvanahalli Post, Nelamangala Taluk, Bangalore Rural Distt.-562111
TU/IV-RD/712	Fouress Engineering (India) Ltd. Mahalaxmi Chambers; 22, Bhulabhai Desai Road Mumbai 400026
TU/IV-RD/2836	Genovo Development Services Ltd. Plot No.36, Bommasandra Industrial Area, Anekul Taluk, Bangalore - 99
TU/IV-RD/1651	Glowtronics Limited 1-D, Hootagalli Industrial Area Mysore -570 018
TU/IV-RD/369	Godavari Sugar Mills Ltd., Fazalbhoy Building, M.G. Road, Fort, Mumbai 400003
TU/IV-RD/259	Graphite India Ltd. 31, Chowringhee Road Kolkata 700 016
TU/IV-RD/2631	Healthline Pvt. Ltd. IS-21, KHB Indl. Area, Yelahanka New Town, Bangalore-560064
TU/IV-RD/2722	Hikal Limited 603, Great Eastern Chambers, CBD Belapur, Navi Mumbai -400 0614
TU/IV-RD/1786	Himalaya Drug Company, The Makali Bangalore -562123
TU/IV-RD/330	Hind High Vacuum Company Pvt. Ltd. Site No.17, Phase-I, Peenya Industrial Area Bangalore -560058

Recognition No.	Name and Address of the Firm with In-House R&D Unit registered
TU/IV-RD/2665	Hindalco Industries Ltd. Century Bhawan, 3rd Floor, Dr. Annie Besant Road, Worli Mumbai – 400 025
TU/IV-RD/307	Hindustan Aeronautics Ltd. 15/1, Cubbon Road, Bangalore -560 001
TU/IV-RD/2375	Hindustan Aeronautics Ltd. 15/1, Cubbon Road, Bangalore - 560 001
TU/IV-RD/2679	Hindustan Aeronautics Ltd. 15/1, Cubbon Road, Bangalore-560001
TU/IV-RD/6	Hindustan Lever Ltd. 165/166, Backbay Reclamation Mumbai -400 020
TU/IV-RD/735	HMT Limited (Tractor Division) 59, Bellary Road Bangalore- 560 032
TU/IV-RD/2335	HMT Machine Tools Ltd. HMT Bhavan, 59, Bellary Road, Bangalore-560032
TU/IV-RD/2507	IFB Automotive Pvt. Ltd. #16, Visveswaraiah Indl. Estate Off. White Field Road, Mahadevapura, Bangalore-560048
TU/IV-RD/2330	Indfrag Limited 1320, 12th Cross, (Double Road) Indiranagar, 2nd Stage, Bangalore - 560 038
TU/IV-RD/1313	Indo-American Hybrid Seeds (India) Pvt. Ltd. 7th Kilometer Banashankari-Kengeri Link Road Channasandra Village, Uttarahalli Hobli, Subramanyapura Post, Bangalore -560061
TU/IV-RD/569	Industrial Research Corporation No.19, 12th Main Road, Malleshwaram(West) Bangalore -560055
TU/IV-RD/2104	Instrument Research Associates Pvt.Ltd. 'SUBHAVAN' PB No.22913 Plot No.73F, Electronics City, Hosur Road Bangalore 560 100
TU/IV-RD/1147	IPA Pvt. Ltd. 472-B2, 12th Cross; IV Phase, Peenya Industrial Area Bangalore- 560058 Bangalore 31.03.2010
TU/IV-RD/790	IQ Infotech Ltd. 17/A, Kumbalagodu Indl. Area, Mysore Road, Bangalore- 560 074
TU/IV-RD/25	ITI Ltd. ITI Bhavan Dooravaninagar, Bangalore -560 016

Recognition No.	Name and Address of the Firm with In-House R&D Unit registered
	Bangalore 31.03.2009
TU/IV-RD/2728	Jalaja Technologies Pvt. Ltd. 6-3-663/B, 2nd Floor MRL House Punjagutta, Hyderabad-500082
TU/IV-RD/677	Jindal Aluminium Ltd. Jindal Nagar; Tumkur Road Bangalore -560073
TU/IV-RD/1035	JK Industries Limited K.R.S. Road; Metagalli Mysore -570 016
TU/IV-RD/1474	John Fowler (India) Pvt. Ltd. No.6/6P, Bomasandra Industrial Area II Phase, Bangalore - 560 099
TU/IV-RD/2782	Kalki Communication Technologies Ltd. #147 2nd Floor, Anatha Pushpa Building 5th Main Road, HSR Layout, 7th Sector Bangalore - 560 102
TU/IV-RD/2813	Karnataka - Hi-tech Agro Enterprises Plot No.M-5 & 6, Industrial Estate, Hatalgeri Naka Gadag - 582 101 (Karnataka)
TU/IV-RD/2055	Karnataka Hybrid Micro Devices Ltd. Plot No, Part 103, 4th Cross, Electronics City, Hosur Road Bangalore -560100
TU/IV-RD/663	Karnataka Soaps & Detergents Ltd. Bangalor-Pune Highway Bangalore -560055
TU/IV-RD/1826	Kavveri Telecom Products Ltd. Plot No.31-36, 1st Main, II Stage, Arakere Mico Layout, Bannerghatta Road Bangalore- 560076
TU/IV-RD/2054	KC Das (P) Ltd. No.3, Rama Krishna Lane Calcutta-700003
TU/IV-RD/552	Kennametal Widia India Ltd. 8/9th Mile;Tumkur Road; Post Box No.7300 Bangalore -560 073
TU/IV-RD/2171	Kumar Organic Products Ltd. Plot No. 36-B, Usha Krishna Tower, Road No. 3 & 5 Jigani Indl. Area, Anekal Taluk Bangalore - 562106
TU/IV-RD/2070	L&T Komatsu Limited Bellary Road, Byatarayanapura Bangalore -560 092
TU/IV-RD/2674	Labland Biotech Pvt. Ltd. 8th KM, K.R.S. Main Road, Mysore-570016

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Recognition No.	Name and Address of the Firm with In-House R&D Unit registered.
TU/IV-RD/2081	Maini Materials Movement (P) Ltd. Maini Sadan, #38, 7th Cross Lavelle Road, Bangalore -560 001
TU/IV-RD/2041	Maini Precision Products (P) Ltd. 6th Floor, Devatha Plaza, 131, Residency Road Bangalore-560025
TU/IV-RD/1045	McDowell & Co. Ltd. Le Parc Rechmonde, 51, Richmond Road, Bangalore - 560025
TU/IV-RD/2400	Medreich Limited (Formerly Medreich Sterilab Limited) Medreich House # 12/8, Saraswati Ammmal Street, M.S. Nagar Bangalore - 560033
TU/IV-RD/2622	Meritor HVS (India) Ltd. Plot No.36, Hootagalli Indl. Area, Off. Hunsur Road, Mysore-570018
TU/IV-RD/2377	Merlinhawk Aerospace Pvt. Ltd., 57/5, 6th Cross, Tank Bund Road, N.S. Palaya, BTM Layout II Stage, Bangalore - 560 076
TU/IV-RD/2155	Micro Labs Limited 303, 3rd Floor, 'A' Wing, Queens Corner Apartments Bangalore - 560001
TU/IV-RD/2775	MicroLOGIX Embedded Controls (P) Ltd. #473, 13th Cross, 4th Phase Peenya Industrial Area Bangalore - 560 058
TU/IV-RD/2207	MKS Systems No.89, East Park Road Malleshwaram, Bangalore - 560003
TU/IV-RD/2228	MRO Tek Ltd. "MRO House" 14, 1st 'D' Main Road Ganganagar Bangalore - 560032
TU/IV-RD/2608	Multiplex Bio-Tech Pvt. Ltd. No.180, 1st Main Road Mahalakshmi Layout Extension, Bangalore-560086
TU/IV-RD/1959	Namdhari Seeds Pvt. Ltd. #119, 9th Main Road Ideal Homes, Rajarajeswari Nagar Bangalore -560098
TU/IV-RD/2000	Natural Remedies Pvt. Ltd. No.364, 2nd Floor 16th Main, 4th T Block, Jayanagar Bangalore -560 041

Recognition No.	Name and Address of the Firm with In-House R&D Unit registered
TU/IV-RD/2663	Navya Biologicals Pvt. Ltd. #126/C, 3rd Cross, 4th Block, S.T Bed, Koramangala Bangalore-560034
TU/IV-RD/2271	Nunhems Seeds Pvt. ltd. Dhumaspur Road, Badshahpur Gurgaon-122 001
TU/IV-RD/2764	OnMobile Global Limited 26, Bannerghatta Road JP Nagar, 3rd Phase Bangalore - 560 076
TU/IV-RD/2272	Organica Aromatics (Bangalore) Pvt. Ltd. No. 407, 11th Cross, 4th Main, 4th Phase Peenya Bangalore-560058
TU/IV-RD/2392	Oriental Biotech Limited Oriental Towers, 51, Central Street Bangalore-560 001
TU/IV-RD/527	Otis Elevator Co. (India) Ltd. 9th Floor, Magnus Towers, Mind Space Link Road, Malad (West) Mumbai - 400064
TU/IV-RD/2461	Park Controls and Communications Ltd. 22, 80 Feet Road, HAL III Stage, Bangalore-560075
TU/IV-RD/2807	Perfint Engineering Services Pvt. Ltd. No.16, III Floor, South West Boag Road T. Nagar Chennai - 600 017
TU/IV-RD/1286	Pest Control (India)Pvt. Ltd. Jagdamba House, Next to Anupam Theatre, Peru Bagh, Goregaon (E) Mumbai - 400063
TU/IV-RD/2344	Phytomyco Research Pvt. Ltd., 481, 3rd Stage, 5th Main, 11th Cross, Gokulum Mysore - 570 002
TU/IV-RD/2619	PI Drugs & Pharmaceuticals Ltd. 116, Vardhaman Indl. Complex, L.B.S. Marg, Thane (West)-400601 Plot No.SPL-9 Indl. Area, Kumta,
TU/IV-RD/2659	Polyclone Bioservices Pvt. Ltd. 47, 4th Main, 25th Cross, Karesandra, Banashankari 2nd Stage Bangalore-560070
TU/IV-RD/1588	Priyaraj Electronics Ltd. 18A/19, Doddanekundi Indl. Area, Mahadevapura Post, Bangalore -560048
TU/IV-RD/1882	Process Pumps (I) Pvt. Ltd. Plot No.86, III Phase, Peenya Industrial Area Bangalore -560058

Recognition No.	Name and Address of the Firm with In-House R&D Unit registered
TU/IV-RD/246	Processor Systems (India) Pvt. Ltd. 24, Richmond Road Bangalore -560 025
TU/IV-RD/2273	Prudent Communication System Pvt. Ltd. No. 18, Railway Parallel Road Kumara Park East Bangalore-560001
TU/IV-RD/1982	Rajapalayam Mills Ltd. Post Box No. 1; PAC Ramasamy Raja Road Rajapalayam-626117
TU/IV-RD/2729	Raman FibreScience Private Ltd. 313, 5th cross 7th 'B' Main, Koramangala 4th Block, Bangalore-560 034
TU/IV-RD/796	Rapsri Engg. Industries Ltd. 39 & 40/2, Gowdanpalya, Subramanyapura Post Bangalore -560061
TU/IV-RD/2345	Resil Chemicals Pvt. Ltd. Unit No. 30, BCIE, Old Madras Road, Bangalore - 560 016
TU/IV-RD/2126	Resonance Laboratories Pvt. Ltd. 832, 37th Cross, 22nd Main, 4th 'T' Block, Jayanagar Bangalore -560 041
TU/IV-RD/2137	Reva Electric Car Co. Pvt. Ltd. 7th Floor, Devatha Plaza, 131, Residency Road Bangalore- 560 025
TU/IV-RD/2523	Sagas Autotec Pvt. Ltd. #230, Sharada Complex 1st Main, Gokulam 2nd Stage, Mysore-570002
TU/IV-RD/1988	Sami Labs Ltd. No.19/1 & 19/2, I Main, II Phase, Peenya Indl. Area, Peenya, Bangalore -560 058
TU/IV-RD/407	San Engg & Locomotive Co. Ltd. Whitefield Road Bangalore- 560048
TU/IV-RD/1655	Sanmar Speciality Chemicals Ltd. 38, Old Mahabali Puram Road Perungudi Chennai - 600 096
TU/IV-RD/2514	SLN Technologies Pvt. Ltd. # 889, 4th Cross, 7th Main, HAL 2nd Stage, Indiranagar, Bangalore-560008
TU/IV-RD/515	Southern Electronics (Bangalore) Pvt. Ltd. 16-A, Peenya Industrial Area; Phase-I;Peenya Bangalore -560058

Recognition No.	Name and Address of the Firm with In-House R&D Unit registered
TU/IV-RD/2827	Strand Life Sciences Pvt. Ltd. 237, Sir C.V. Raman Avenue Rajmahal Vilas Bangalore - 560 080
TU/IV-RD/2310	Strides Arcolab Ltd. "Strides House" Opp. to IIMB Bilekahalli Bamnnorghatta Road Bangalore - 560076
TU/IV-RD/2264	Strides Research and Specialty Chemicals Ltd. 120 A&B, Industrial Area Baikampadi New Mangalore - 575 011
TU/IV-RD/2849	Stumpp, Schuele & Somappa Pvt. Ltd. No.139/2, Hosur Road, Karamangala Bangalore - 560 095
TU/IV-RD/1784	Tally Solutions Pvt. Ltd. 331-336, Raheja Arcade; Koramangala Bangalore -560034
TU/IV-RD/1255	Tata Coffee Ltd. Pollibetta-571215, South Kodagu, Kodagu Dist. Karnataka
TU/IV-RD/2783	Tejas Networks India Limited #58, 1 Main JP Nagar, 3rd Phase Bangalore - 560 078
TU/IV-RD/1796	Tetragon Chemie Pvt. Ltd. IS-40, KHB Industrial Area, Yelahanka New Town Bangalore -560064
TU/IV-RD/1545	Titan Industries Ltd. Golden Enclave, Tower A; Airport Road Bangalore -560052
TU/IV-RD/2845	Triesta Sciences (India) Pvt. Ltd. HCG Tower, #8 P. Kalingarao Road, Sampangiramnagar Bangalore - 560 027
TU/IV-RD/2334	Triveni Engineering & Industries Ltd. (Turbine Business Group) 12-A, Peenya Indl. Area Bangalore - 560 058
TU/IV-RD/1108	Tummala Electronics Pvt. Ltd. SB-54, 2nd Cross; Peenya Industrial Estate; Peenya Bangalore- 560 058
TU/IV-RD/1813	Turbotech Precision Engineering Pvt. Ltd., Survey No. 8/2, Kasaba Hobli, Honnasandra Village, Nelamangala Tuluk Bangalore -562 123
TU/IV-RD/1074	Ugar Sugar Works Ltd., The Mahaveer Nagar, Wakhar Bagh, P.O. Sangli -416 416
TU/IV-RD/2829	United Genetics India Pvt. Ltd. No.527, "F" Block, 60 Feet Road Sahakarnagar Bangalore - 560 092

Recognition No.	Name and Address of the Firm with In-House R&D Unit registered
TU/IV-RD/1480	United Telecoms Ltd. 777-G, 100 Feet Road, HAL 2nd Stage, Indira Nagar, Bangalore -560 038
TU/IV-RD/1756	VST Tillers Tractors Ltd. Whitefield Road; P.B. No.4801, Mahadevapur Bangalore 560 048
TU/IV-RD/930	Welcast Steels Ltd. Plot No. 15, Phase - I Peenya Indl. Area Bangalore -560 058
TU/IV-RD/2586	WeP Peripherals Ltd. 40/1A, "Basappa" Complex, II Floor, Lavelle Road, Bangalore-560001
TU/IV-RD/1162	West Coast Paper Mills Ltd., The Bangur Nagar Dandeli -581 325 Dist. Uttar Kannada, Karnataka
TU/IV-RD/2478	Wipro Fluid Power Ltd. 9B-10A, Phase I, Peenya Industrial Area, Bangalore-560058
TU/IV-RD/2436	Wipro Ltd. (Wipro Consumer Care Division) Doddakannelli, Sarjapur Road Bangalore - 560035
TU/IV-RD/2177	Zuari Seeds Limited No. 805, 13th A Main, 80 Feet Road Yelahanka New Town, Bangalore - 560 064

Research Institutions engaged in Traditional Knowledge in Karnataka

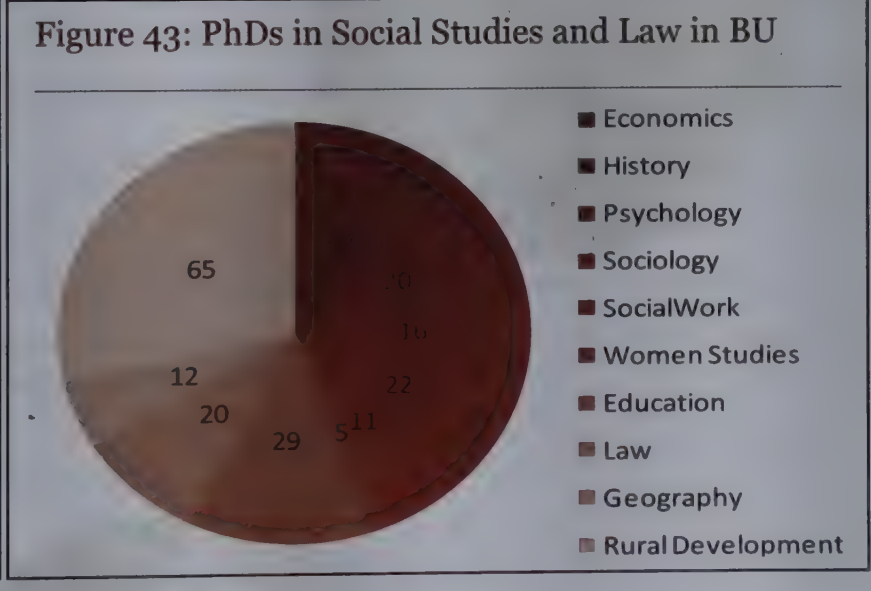
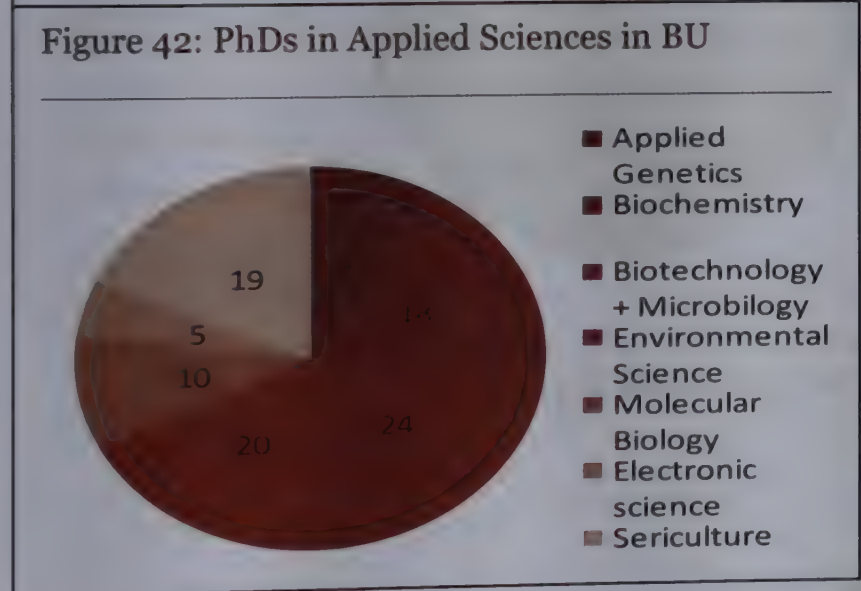
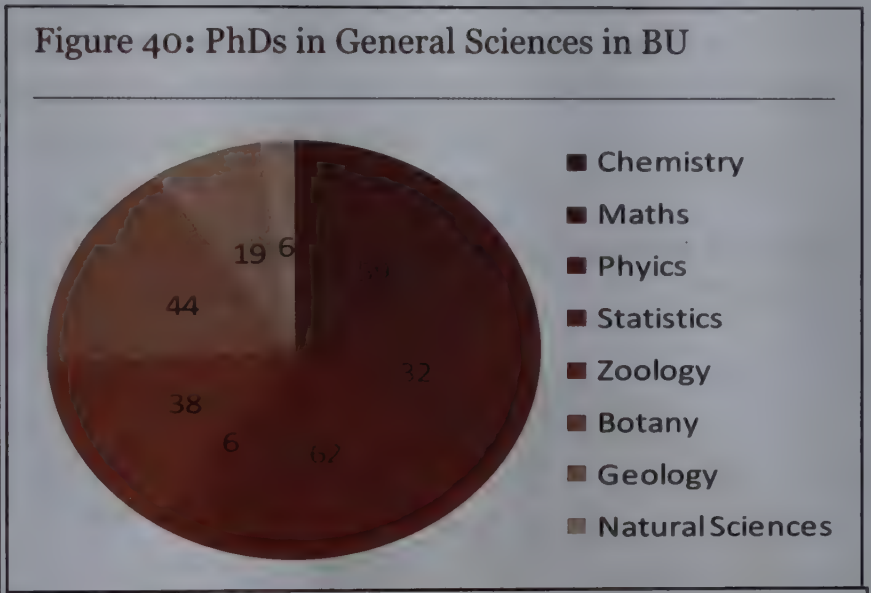
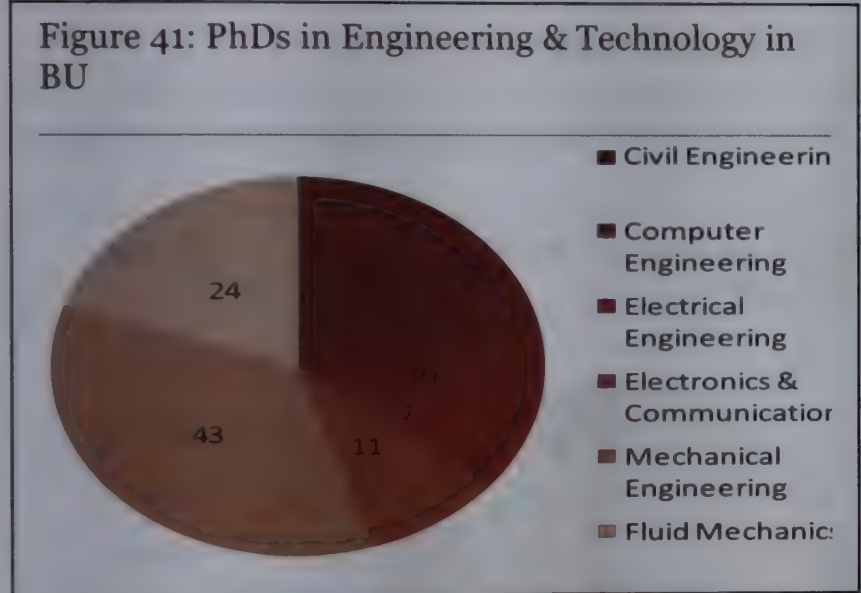
Name	
Foundation for Revitalization of Local Health Traditions	No.74/2, Jarakbande Kaval, Post : Attur, Via Yelahanka, Bangalore - 560 106.
Indian Institute of Science	Indian Institute of Science Bangalore 560 012, INDIA
Honey Bee Network	There is a Regional Collaborator for Karnataka

Annexure V

Selected Examples of doctoral trends in Karnataka⁶⁸

Example I: Study of PhDs registered with Bangalore University (2008-09):

- The total number of PhD students enrolled with Bangalore University, during the academic year 2008-09 were 1002, out of which 307 (31 %) were women.
- It is an encouraging fact that 65 students were enrolled for PhD in Rural Development and 60 of them belong to SC/ST category. This department in fact produced the maximum number of PhDs (in a sub stream) in the University in 2008-09 followed by Physics (62) and Chemistry (59)
- A total of 105 students were registered for PhD in different streams of Applied Sciences like Biotechnology (24), Sericulture (19), Biochemistry (18), Applied Genetics (9), etc.
- A total of 388 students were doing PhD in different areas of engineering and general sciences.

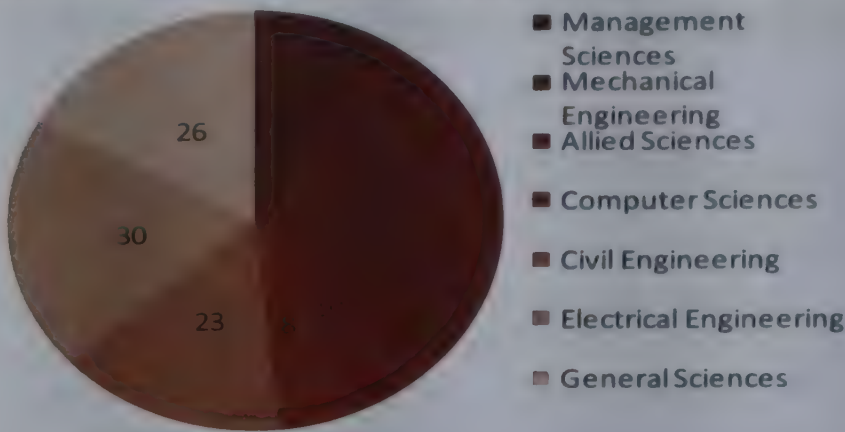


⁶⁸ Analysis of the Annual Reports of Bangalore University(2008-09), Visvesvaraya Technological University (2008-09),Gulbarga University (2008-09), Mysore University (2009-10)

Example II: Study of PhDs registered with Visvesvaraya Technological University, Belgaum (2008-09):

- Total number of PhD students in 2009 was 153 only.
- There were 13 PhD students in Management Sciences, 10 in Applied Sciences, 26 in General Sciences and rest in the different branches of Engineering.

Figure 44: PhD Segregation in VTU



Example III: A Study of PhDs registered with Gulbarga University (2008-09):

- The total number of PhD students during 2008-09 were 220, out of which 61 (36.1 %) were women. The number is very less(around 22% only) compared to that of Bangalore University
- 66 PhDs in different areas of social sciences and law form the largest number of PhDs discipline wise. The University does not offer any engineering seats for PhDs. As most Engineering departments are either affiliated with Bangalore University or VTU.

Figure 46: PhDs in General Science in Gulbarga University



Figure 45: PhDs in Applied Sciences in Gulbarga University

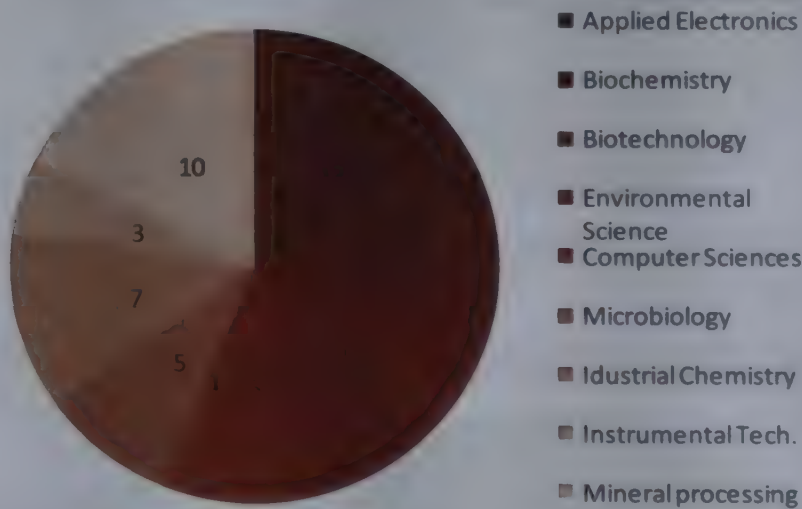
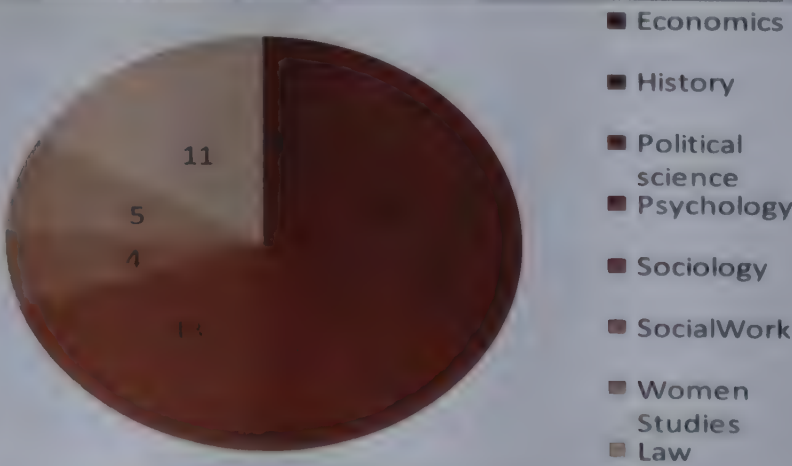


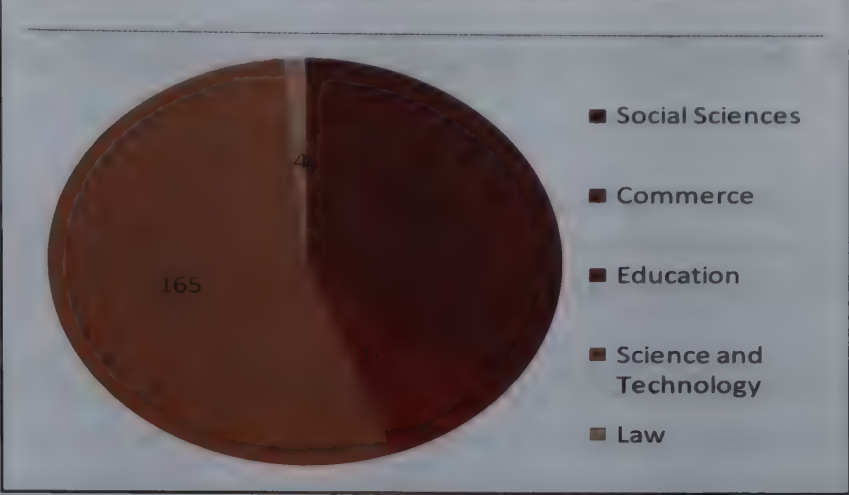
Figure 47: PhDs in Social Studies & Law in Gulbarga University



Example IV: Study of PhDs registered with Mysore University (2009-10):

- During 2009-10, a total of 304 students were registered in different PhD programs of the university.
- 54 per cent of PhDs are in the area of Science & Technology followed by Social Sciences(107 students)
- 33 per cent of the total PhD students were women.

Figure 48: PhD Segregation in Mysore University



Annexure VI

A Profile of leading Industries in Karnataka

Profile of the leading industries such as IT/ITeS, biotechnology, engineering, telecommunications and electronics, textiles and apparels, aeronautics and aerospace have been detailed below. Their district wise presence has also been highlighted.⁶⁹

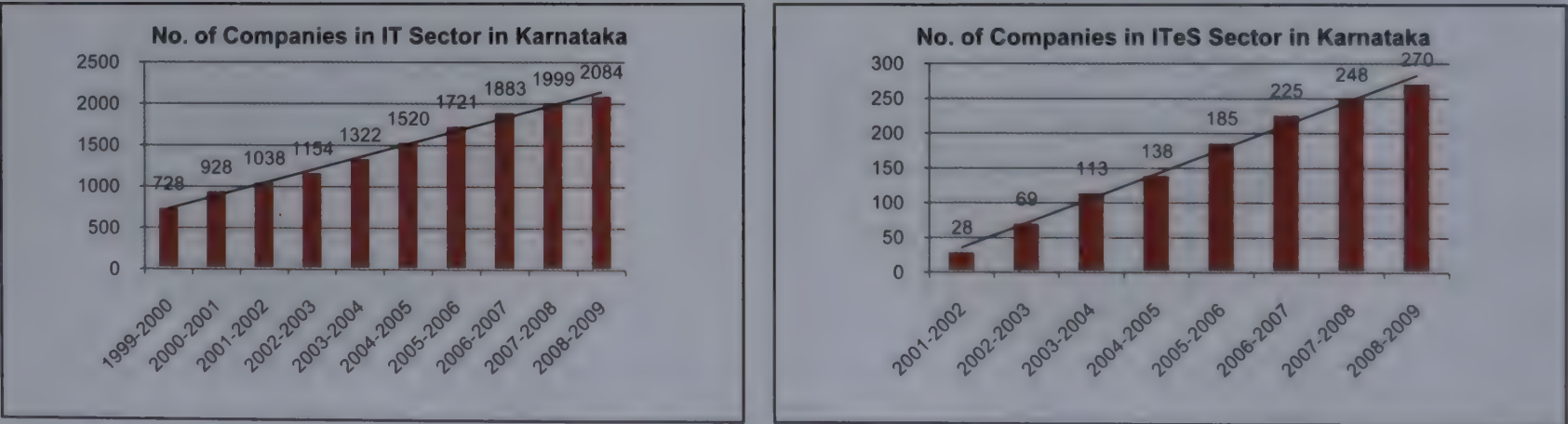
1. Information Technology (IT) & IT enabled Services (ITeS)

Karnataka has over 2001 operational companies in the IT/ITeS space, employing over 5.5 million professionals. Moreover about 50 percent of the world's SEI CMM Level 5 certified companies are located in Bangalore. The city is also among the five largest technology hubs in the world. Key drivers for this sectoral success in the state include: appropriate ecosystem for knowledge-driven industries, proactive government, sector-friendly policy and large pool of skilled manpower.

District wise Mapping

Apart from Bangalore Urban, the other emerging and potential IT R&D destinations in Karnataka include Mangalore, Mysore, Dharwad, and Shimoga. Mysore has 49 Software Technology Parks of India (STPI) registered companies with exports of \$185 million in 2006-2007, a 250 per cent growth over the previous. Mangalore has 24 STPI registered companies with exports of \$166 million in 2006-07 and Dharwad (Hubli) has 13 STPI registered companies with exports of about \$2.1 million in 2006-07⁷⁰. Almost all the leading IT companies in the world including: Infosys, Wipro, TCS, Oracle, Dell, IBM, Microsoft, Accenture, Cognizant and Yahoo are present in the state. The growth in the number of IT and ITeS Companies in Karnataka is illustrated below:

Figure 49: Companies in IT and ITeS Sectors in Karnataka, Dept of IT, BT and S&T (2010)



The existing as well as the new IT and ITeS companies are engaged in sector specific research through world class in house R&D Centres in Karnataka. Moreover the R&D activity in the sector is positively correlated with the increasing number of companies and follows a parallel linear upward trend. In fact Corporate R&D Centres form a significant pool of R&D Performers in the State and the research produced by them create value and knowledge for the global population. The details of the same are profiled in the table below.

⁶⁹ Secondary data for this section has been collected from Industry & Business Reports for Karnataka, IBEF – CII (2009-10), www.ibef.org, Company websites and Department website of IT,BT and S&T (2010)

⁷⁰ Industry & Business Report for Karnataka, IBEF –CII, 2009-10, www.ibef.org

R&D Profile of Key IT & ITeS Players in Karnataka

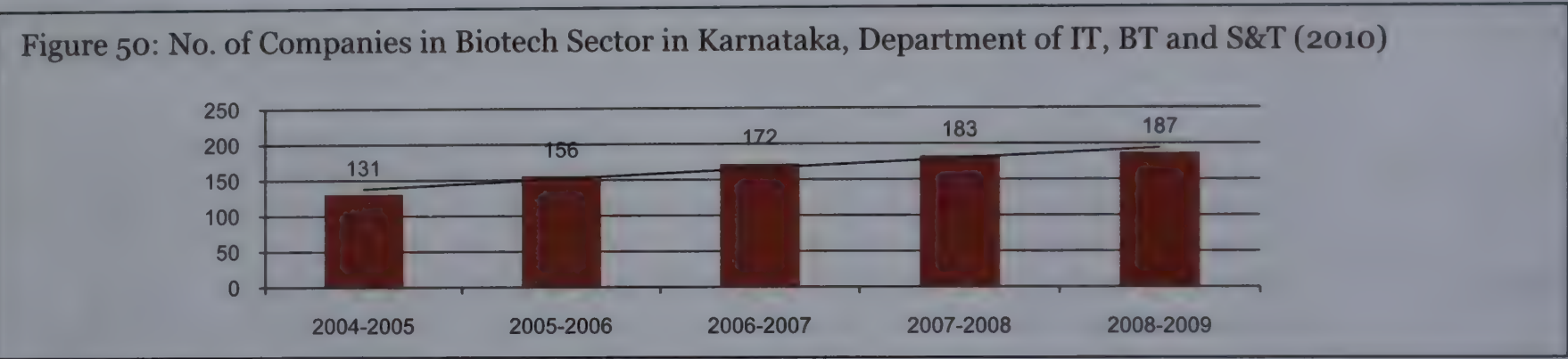
Company	Presence and R&D Profile in Karnataka
Infosys	Infosys has operations at Bangalore and Mysore with a 60,000-plus-people capacity and is in the process of adding another 30,000 seats. It has several Centres of Excellence in the State and the ALSTOM-Infosys R&D Centre is currently being set up with an objective of providing high-end engineering solutions.
Wipro	Based out of Bangalore, the company has 54 development centres and 30 offices spread across India, North America, the Middle East and Europe. It provides application development, deployment and maintenance and business intelligence services. In September 2009, the company launched its Centre of Excellence on its Electronic City campus; to work with other leading IT firms to develop innovative IT solutions
GE India	GE India has a state-of-art R&D Facility, largest of its kind outside US called : John F Welch Technology Centre with 1800+ researchers
Oracle	Oracle opened its India Development Centre (IDC) in Bangalore in 1994. This contributes to core software development across the entire Oracle product family
HCL Technologies	HCL provides turnkey solutions for hardware, software and services, such as network management services, security services, IT infrastructure services, present in over 170 locations across India; In 2008-09, HCL Technologies' Indian operations reported revenue of US\$ 1.9 billion.
CISCO	CISCO has over 4,850 employees in India. Present in areas core technologies, such as routers, switches and LANs and advanced technologies, such as WLAN, security systems, enterprise telephony, etc. The Cisco Global Development Centre is based in Bangalore
IBM	IBM has been present in India since 1992 with regional headquarters in Bangalore. 57,000 employees in IBM India (2007) provide end-to-end solutions to customers from hardware to software, services and IT consulting. IBM has a significant presence in Bangalore with Software Innovation Centre, India Software Lab, High Performance On Demand Lab, Engineering and Technology Services Centre, Services Innovation and Research Centre, Global Business Solution Centre and Business Transformation Outsourcing Centre.
Texas Instruments	TI was the first MNC to set up an R&D Lab outside US and later set up the System-on – Chip Centre of Excellence in Bangalore . TI has been awarded the highest (225) patents amongst all R&D Centres across India. TI has 27,500 employees worldwide, of which around 1,400 are based in its R&D centre in Bangalore
TCS	One of the leading Indian IT services, business solutions and outsourcing companies; revenue of US\$ 6 billion in 2008-09; employs over 143,000 people worldwide with a presence in 42 countries and has several centres in Karnataka.
Mindtree	Based in Bangalore, Mindtree is an Indian IT Solutions company, specialising in IT services, independent testing, infrastructure management and technical support, knowledge services and product engineering. In September 2009, Mindtree was ranked among the top five global R&D service providers.
Hewlett Packard	One of the foremost technology companies in the world, with a presence in over 170 countries. Revenue of US\$ 114.6 billion for the year ending October 2009, of which its Indian operations accounted for US\$ 3.4 billion in 2008-09; HP has seven R&D centres across the globe, of which one is at Bangalore
Honeywell International India	Honeywell has been present in India since 1995 with over 10,000 employees in the country. The company opened a US\$ 50 million R&D and engineering facility in Bangalore in early 2009.
	One of the largest software companies in the world, Microsoft has been present in India since 1990 and employs 5,000 people; it has two divisions in Bangalore: Microsoft Research India (MSR), established in 2005 and focuses on developing technology for emerging markets , and Microsoft Global Technical Support Centre

Company	Presence and R&D Profile in Karnataka
	(GTSC), established in 2003, which focuses on providing high level technical resolution services. Additionally, it has set up a Microsoft Technology Centre in Bangalore.
Intel	Intel is the largest chip designer and manufacturer in the world and has four offices in based in Bangalore. Intel's India Design Centre was set up in 1999 in Bangalore.

Source: Compiled from Company websites and IBEF Reports

2. Biotechnology

Karnataka is home to more than half of biotechnology-related companies in India. Moreover Bangalore has the largest bio-cluster in India generating one fifth of sector specific revenues through its 180+ biotechnology companies. The Biotech Sector is growing in the State and the increasing trend is represented in the Figure below:



Key Facts about the Biotechnology Sector in Karnataka include:

- **Personnel Strength in Biotech:** Karnataka has a headcount of over 6,800 scientists involved in biotech research (2009, CII Publications)
- **Presence of premier Life Sciences institutions** such as Indian Institute of Science, National Centre for Biological Science and Jawaharlal Nehru Centre for Advanced Scientific Research.(Also see Annexure)
- **Vision Group on Biotechnology** to advise government on policy issues and **17 task forces** for support to biotech-related areas.
- **Key Sector Players include:** AccelrysInc, AdvantaIndia, AstraZeneca, AvesthaGengraineTechnologies, AurigeneDiscoveryTechnologies, Biocon, ReaMetrixIndia, StrandGenomics, SyngeneInternational, Xcyton etc

District wise Mapping

The key existing and potential R&D destinations for Biotechnology (including Pharmaceuticals, Marine and Agro Biotech centres) in Karnataka are Bangalore Urban and Rural, Mangalore, Dharwad, Bidar, Mysore and Hassan.

R&D Profiles of the Key Biotech Firms in Karnataka

Company	Presence and R&D Profile in Karnataka
Biocon	Company has an integrated biotech hub called BioconPark which undertakes Biotech research in Bangalore and in addition is proposing to set up a SEZ at Annekalin Bangalore.
Astra Zeneca	Area: manufacturing bulk drug chemicals, liquid formulations, tablets and capsules, injectibles and ointments for various diseases. Manufacturing plant spread over a 70-acre plot located at Yelhankain Bangalore. R&D centre situated on an area of about 1 million sq ft in Bangalore.
Himalaya	The Company was founded in 1930 and corporate headquarters is based in Bangalore. In

Company	Presence and R&D Profile in Karnataka
Drug Company	2003, it started a new State of Art manufacturing unit and R&D centre in ayurvedic medicine and formulations at cost of USD 35 million in Bidadi, Bangalore . Also has an integrated R&D Lab in Bangalore
Avesthagen	Established in 1998, discovery-based life sciences company focussing on achieving convergence between food, pharmacy and population genetics leading to preventive personalized medicine. The company has established state-of-the-art laboratory facilities at the International Tech Park in Bangalore which has around 200 employees. Also a major patentee, as per Table on Patents earlier.
Advanta India	Associate company of the agrochemical group, United Phosphorus. Bangalore is a key R&D location.
GlaxoSmithKline Pharmaceuticals Ltd	Established in 1924, it is one of the oldest pharmaceutical companies in India; manufactures primarily prescription medication and vaccines. India's revenue for 2008 was US\$ 408.7 million. GSK has a clinical development centre in Bangalore
Jubilant Orgaosys	Largest Custom Research and Manufacturing Services (CRAMS) company in India; specializes in Pharma and Life Sciences Products and Services (PLSPS) and Industrial and Performance Polymer Products (IPP); Has a manufacturing facility in Nanjangud, which employs over 625 people.
Strand Life Sciences Pvt. Ltd.	Among the top pharmaceutical and biotech companies; its core strengths lie in data mining, bioinformatics, and predictive modelling with corporate headquarters in the Kirloskar Business Park, Bangalore. In December 2009, the company was selected by the government of Karnataka to spearhead its bio-IT centre, which would involve an investment of US\$ 6.96 million.
ReaMetrix India Pvt. Ltd.	Indian-based biotechnology company with operations in USA and in India; focuses on medical diagnostics solutions. Bangalore is an R&D and innovation hub for the company.
Bangalore Genei	Established in 1989, one of the first to perform biotech research in India; specialises in design, development, production, testing and marketing of biological research products. The company has a state-of-the-art research and development laboratory and this Bangalore-based company plans to enter and expand in US and European markets.
Millipore India Private Limited	Millipore is an American life sciences company, which provides technologies, tools and services for bioscience research and biopharmaceutical manufacturing. 300 employees work in India with the company's India headquarters in Bangalore. It has a Bioprocess (manufacturing process research) as well as a Bioscience (biotech technologies) division in Bangalore
Aurigene Discovery Technologies Limited	Established in 2002 in Electronic city Bangalore, is Drug discovery biotechnology firm; pipeline of 15 discovery programmes; the company is a subsidiary of Dr. Reddy's Laboratories
Syngene International Private Limited	Established in 1994, Syngene is a reputed biotech firm specialising in contract research and manufacturing; it is a subsidiary of biotech giant, Biocon. It has modern research and development and production facilities in Bangalore

Source: Compiled from Company websites and IBEF Reports

3. Engineering

According to a study by the Confederation of Indian Industry, production in Karnataka's engineering industry increased 5-8 per cent during April-September 2008 as compared to October 2007-March 2008. Sales increased by 8 per cent during the period. The exports increased by 2-4 per cent and the capacity utilisation level increased by up to 8 per cent. Bharat Earth Movers Limited, Hindustan Machine Tools Limited, ABB, Bharat Heavy Electricals Limited etc are among the leading companies in this sector in the state. Most of these Engineering companies have several manufacturing units in Bangalore and some are also supported by R&D centres. ABB's R&D profile is worth mentioning and is covered below:

R&D Profile of ABB

ABB has set up its Global Corporate R&D Centre in Bangalore which works on hi-tech projects and is first of its kind outside US and Europe. The areas of research are industrial IT development and deployment. It also helps maintain and support a range of software intensive products and partners with other ABB R&D Centres. Total ABB personnel strength is 3400+.

District wise Mapping

The key existing and potential R&D destinations for Engineering in Karnataka are Bangalore Urban, Udupi, Shimoga and Chickmagalore.

4. Telecommunications and electronics

Karnataka is a leading state in the electronic and telecommunications industry, with as many as 300 leading international companies. There are several public sector electronics companies and defence research institutions in Karnataka (compiled in Annexure II). It has a sizeable telecom infrastructure with 140 out of 170 towns connected by OFC network. A hardware technology park of 1,200 acres has been proposed at Devanahallinear international airport and another one at Mysore. (Source: 2009 CII Reports). Some of the key players include: Siemens, Philips, Voltas, Blue Star, Nokia, and Samsung. Two significant R&D Performers in this sector are Phillips and Nokia which are covered below.

Key R&D Profiles

- Philips, a leader in consumer electronics, healthcare and lighting systems has been present in India for over 75 years and employs over 4,500 people in India. The company has R&D facilitation –Philips Innovation Campus.–at Bangalore.
- Nokia began India operations in 1995 and has opened an R&D facility and a design studio in Bangalore. Personnel strength: 15,000+ people in India (March 2008, CII Reports)

District wise Mapping

Bangalore Urban, Tumkur, Mysore, Shimoga, Hassan, Dharwad are the major districts with respect to telecommunication and electronics (including hardware development) related existing and potential R&D activities are concerned.

5. Automobiles

Out of the total 201 listed auto-ancillary firms in India, 10 are based in Karnataka. The State Government has set up Auto Parks at Bidadi, Bengaluru, Shimoga and Dharwad for automobile ancillary and servicing units. Key players include: Toyota Kirloskar, Volvo, TVS Motors, Bosch, Brakes India, and Automotive Axles.

Key R&D Profiles

- General Motors has invested US\$ 21 million to set up a Technical Centre in Bangalore
- The Delphi Technical Center India is located at the International Technology Park, Bangalore. The center was inaugurated in March 2000 to develop software for Delphi's worldwide vehicle applications and to help the company keep pace with changing needs.

District wise Mapping

Existing and Potential R&D centres include districts like Ramanagara, Bangalore Urban, Shimoga and Dharwad and Bidar is also upcoming.

6. Textile and apparel

Karnataka produces 70 percent of India's silk and it is a major apparel sourcing destination for the global market. The sector has potential for future growth with the Apparel Park at Bangalore and mega textile parks in

other parts of the state. Moreover in July 2008, the Karnataka Government proposed to establish 11 textile parks to give a boost to the textile industry in the state. The Bellary district with a proposed 175 acre apparel park specializing in denim based garments is an emerging centre for textiles in Karnataka. Key players include: Gokaldas Exports, Karnataka Silk Industries Corporation (KSIC), Forbes Gokak Limited, Himatsingka Seide, Shahi Exports Private Limited, Zenith Exports, Indus Fila etc.

Key R&D Profiles:

Karnataka Silk Industries Corporation is a Government of Karnataka enterprise; a leading manufacturer of silk with factories in Mysore as well as T. Narasimpura. The company tied up with the National Institute of Fashion Technology for developing new designs for silk.

District wise Mapping

Bangalore Urban, Hassan, Mysore are the three key districts for Textile and Apparel industries and development centres.

7. Agro and food processing

The state accounts for 70 percent of the country's total coffee production. It ranks second in the production of flowers; also one of the leading producers of fruits and vegetables. The state promoted an SPV, Food Karnataka Limited (FKL), in 2004, to attract private investments in six proposed food parks across the state. In 2009-10, the state proposed to set up a Spice Park at Byadagi in the Haveri district. Key Players include: Hindustan Unilever, Britannia, Nestle, United Breweries, MTR Foods, and Cadbury India etc.

Key R&D Profiles:

Hindustan Unilever has 35 manufacturing facilities throughout India and in various parts of Karnataka, such as Bangalore, Mangalore, Mysore and Dharwad. Bangalore is home to one of Unilever's Global R&D centres, which, among other products, also specializes in beverages, ice creams and processed foods.

District wise Mapping

Bangalore Urban and Rural, Mangalore, Mysore, Dharwad, Belgaum, Kolar are key and upcoming districts with Agro and Food processing industries and R&D Centers in Karnataka.

8. Aeronautics & Aerospace

The state also has a legacy of research in the fields of aeronautics and aerospace. The Indian Space Research Organisation (ISRO), the primary body for space research under the control of the Government of India, and one of the leading space research organizations in the world, is headquartered in Bangalore.

Key R&D Profiles:

Some of the key R&D in Aeronautics takes place in Aeronautical Development Agency, Defence Research and Development Organisation (DRDO), Aeronautical Development Establishment (ADE), etc. The state-owned Hindustan Aeronautics Limited (HAL) is one of Asia's largest aerospace companies and also based in Bangalore. The National Aerospace Laboratories (NAL) is India's second largest aerospace firm after Hindustan Aeronautics (HAL). NAL is a high technology oriented civilian aerospace laboratory concentrating on advanced topics in the aerospace and related disciplines with its headquarters in Bangalore.

District wise Mapping

The presence of Aerospace Industries is largely around Bangalore and Belgaum. In 2009, QuEST established India's first aerospace SEZ in Belgaum which comprises 300 acres dedicated to offering design, manufacture of components and systems.

Annexure VII

Brief Profile of Traditional Knowledge in Karnataka

Karnataka, earlier known as Mysore, came into being on November 1, 1956 with the merger of five territories where Kannada was the main language. The term Karnataka was derived from Karanadu, which means lofty land. The State was formed out of four districts of the erstwhile: Bombay State; three districts of the erstwhile princely state of Hyderabad; two districts and one taluk of the former Madras Presidency; the former Part C state of Coorg (now called Kodagu) and nine districts of the former princely state of Mysore. Currently, Karnataka has 30 revenue districts and 175 taluks with a population of 59.4 million.

Karnataka has also been fortunately ruled by culturally oriented dynasties such as the Kadambas, Gangas, Chalukyas, Rashtrakutas, Hoysalas, and the rulers of Vijayanagara, Keladi, Sultans of Deccan, Hyder Akli, Tipu Sultan and Wodeyars of Mysore. Karnataka has also had a list of prominent personalities such as Mayurashrama, an epitome of self-respect, Pulakesi II, Hoysala Vishnuvardhana, the benevolent Krishnadevaraya, queens such as Chennamma and Abbakka, Tipu Sultan, Rajarshi Krishnaraja Wodeyar IV and philosopher statesman Jayachamaraja Wodeyar. Religious savants such as Shankara, Ramanuja, Madhwa, Basavanna, Akkamahadevi, Vyasaraya, Purandaradasa and Kanakadasa also made significant contributions. For instance, Basava's knowledge stream inculcated qualities of socialism and emphasized on development of one's inner knowledge as important over development of the wealth of the society and nation. Acharya Adi Shankara came all the way from Kerala chose Shingeri in Karnataka for his religious activities in propagating Advaita⁷¹.

Even Kannada literature has been nourished by a host of men and women beginning from the writer of Halmidi inscription (the earliest attested full-length inscription in the Kannada language and script, is dated to 450 CE), Ranna, Ponna, Pampa, Harihara and a host of others. The earliest available literary work, the Kavirajamarga, has been dated to 850 CE. Kuvempu, the renowned Kannada poet and writer who wrote Jaya Bharata Jananiya Tanujate, the state anthem of Karnataka was the first recipient of the "Karnataka Ratna" award, the highest civilian award bestowed by the Government of Karnataka. Contemporary Kannada literature is well recognized in the arena of Indian literature, with seven Kannada writers winning India's highest literary honour, the Jnanpith award, which is the highest for any language in India.

Karnataka is home to diverse forms of arts, crafts, dance and music. Karnataka has classical dances such as bharatnatyam(mysore style) and ritualistic dances such as Puja Kunitha, Devare Thatte Kunitha, Yellamma Kunitha, Suggi Kunitha, Pata Kunitha, Gorava Kunitha, Dollu Kunitha, Kamsale, Somana kunita (Mask dance), Huttari Dance and Bolak-aat, Hulivesha (Tiger Dance) to its fame. Yakshagana and Byalatta, Gondaligara Ata (Narrative performing art) , Karadimajal, Togalu Bombe aata are unique forms of folk theatre of Karnataka. Mysore painting, Bidriware (metal ware), Kinhal craft, sandalwood craft, Channapatna toys signify Karnataka's richness in crafts/arts.

Some of the fine architectural creations of Chalukyan period are Nannesvara, Brahma Jinalaya (Lakkundi), Doddabasappa temple (Dambal), Mahadeva Temple (Ittagi), Kaitabhesvara temple (Kubatur) to name a few. Hoysala architecture offered its own style with very minute sculptures and some of the celebrated sculptors of Hoysala empire are Dasoja, Chavana, Mallitamma, Chaudaya, etc. Some of the excellent temples of the Hoysalas are Lakshmidēvi temple, Viranarayana (Belavadi), Siva (Arasikere), Mallikarjuna, Jaina temples at Halebid, etc. Hampi, under the Vijayanagara empire became the centre of a great cultural movement with monuments such as Hemakuta Hill, Virupaksha, Achyutaraya, Vitthala, Krishna, Hajara Rama temples and massive buildings like elephant stables, Lotus Mahal, etc. The Wodeyar dynasty contributed a great deal towards literature, music and architecture and made Mysore a city of Palaces. During the medieval times, Karnataka had the rule of Bahamani, Adil Shahi and Barid Shahi Sultans and Karnataka became a great centre of Islamic architecture with Bijapur, Bidar, Gulbarga and Raichur as the focal area of their activity. During the Adil Shah period, the famous Gol Gumbaz and Ibrahim Rauza were built. Some of the other Islamic creations were Jumma Masjid at Gulbarga, Mahmud Gawan's Madrasa at Bidar, Tipu Sultan's Daria Daulat at Srirangapatna. Christians contributed to the heritage of Karnataka by churches, a befitting example being

⁷¹ Karnataka – A Garden of Architecture (Dr. A.V. Narasimha Murthy and Dr. R. Gopal)

Philomena’s church in Mysore built in perpendicular Gothic style. The Sikh community has contributed holy Nanak Jhara Gurudwara at Bidar which is a fine structure of religious significance and great beauty. Later with the advent of British, Colonial style with features from English Architecture coupled with Gothic features became popular in Mysore and Bangalore. The Maharajas of Mysore built the Maharaja’s Palace at Mysore which is one of the most gorgeous palaces of India symbolizing ancient royalty and architectural beauty. Finally, the culmination of the heritage of the Karnataka architecture can be seen at Vidhana Soudha which depicts a continuation of the architectural tradition of the past of more than a thousand years. Uniqueness of our traditional art lies in the fact that our sculptors can carve a Hoysala or a Chalukya type image, as if it was carved by Hoysala sculptors like Dasoja or Mallitamma.

The following table is an attempt to collate and profile various traditional knowledge related aspects of each district⁷² in Karnataka. This list has been prepared by referring to various sources such as books from Department of Kannada and Culture and seeking inputs from experts. However, it must be observed that this is merely an indicative list of traditional forms of knowledge existing in different districts in Karnataka. The Karnataka Knowledge Commission should handover the initiation of compilation of such data either to Department of Kannada and Culture or to the State Biodiversity Control Board. The data such compiled must also be made available on the public domain on the state’s website to ensure that people can be proud of their rich glorious traditional aspects of knowledge. (An indicative map based on this table is presented in the Section on Traditional Knowledge earlier)

Region	District	Category/Area	Forms of knowledge
Hyderabad Karnataka	Bidar	Traditional art	<ul style="list-style-type: none">• Clay art
		Plants	<ul style="list-style-type: none">• Neem species and albizzia lebbeck• Banni or albizzia acacia ferruginae is grown which helps to control insect/pests by harbouring ants
	Gulbarga	Traditional knowledge -healing	<ul style="list-style-type: none">• Traditional local healing methods
		Traditional architecture	<ul style="list-style-type: none">• Different architectural patterns made with stone and mud to deal with hot temperatures; Rainwater harvesting;
		Food habits	<ul style="list-style-type: none">• Food habits such as jowar and chillies to prevent sun-stroke;
		Plants	<ul style="list-style-type: none">• Neem species and albizzia lebbeck• Banni or albizzia acacia ferruginae is grown which helps to control insect/pests by harbouring ants
		Literature	<ul style="list-style-type: none">• Literary works of Basavanna
	Raichur	Traditional architecture	<ul style="list-style-type: none">• Megaliths of Hirebenakal
		Plants	<ul style="list-style-type: none">• Neem species and albizzia lebbeck• Banni or albizzia acacia ferruginae is grown which helps to control insect/pests by harbouring ants
		Literature	<ul style="list-style-type: none">• Literary works of Basavanna
		Traditional medicine	<ul style="list-style-type: none">• Traditional medicine at Chandra bhand PHC for prioritise health condiction Stomach ache, Fever and Loose motion
	Bellary	Traditional architecture	<ul style="list-style-type: none">• Ruins of Vijayanagara (UNESCO Heritage Site) and elephant stables
		Plants	<ul style="list-style-type: none">• Excellent Sandalwood• Bosvillia (Dhupa) and high quality

⁷² Some districts where data was not available have not been mentioned in the list below.

Region	District	Category/Area	Forms of knowledge
Bombay Karnataka			medicinal plants
		Traditional medicines	<ul style="list-style-type: none"> Traditional medicines at Hudem PHC and GAD for prioritized health condition such as Bhedhi, White discharge and Fever; also at S R R Pura PHC and GAD for White discharge, Cough and Cold
	Bijapur	Engineering marvel with whispering gallery	<ul style="list-style-type: none"> Megaliths of Aihole Gol Gumbaz (one of the largest and the most remarkable single buildings in the entire country)
		Nature and agriculture	<ul style="list-style-type: none"> Quality of air and water is good for natural healing of ailments such as Tuberculosis; Rich potential for quality horticultural crops such as grapes and pomegranate;
		Garments	<ul style="list-style-type: none"> Traditional costumes
	Belgaum	Traditional food	<ul style="list-style-type: none"> Sweets from nature for antenatal and postnatal care; Good varieties of amla
		Traditional art	<ul style="list-style-type: none"> Diverse district of Karnataka and Maharashtra culture
		Traditional plants/medicines	<ul style="list-style-type: none"> Traditional medicines for Stomach ache, Cough and Fever at Ashok Nagar PHC
	Dharwad/Gadag/Haveri	Traditional food	<ul style="list-style-type: none"> Pedha
		Literature	<ul style="list-style-type: none"> Literary works of Basavanna
		Garments	<ul style="list-style-type: none"> Form of silk
		Traditional medicine	<ul style="list-style-type: none"> Traditional medicines at Galigiholi koppa PHC for prioritized health conditions such as White discharge, Cough and Isabu
	Uttara Kannada	Traditional Food	<ul style="list-style-type: none"> Marine products to make it as a rich food (Fish into special varieties of dishes) Export of spices Areca cultivations
		Culture	<ul style="list-style-type: none"> Several cultures ranging from coastal to hilly regions Forest-resource based culture(devarkadus (sacred grooves), nagabanas (preservation of reptiles, amphibians and cobras)
		Literature	<ul style="list-style-type: none"> Literary works of Pampa, Banavasi
		Cattle/Wildlife	<ul style="list-style-type: none"> Unique cattle breed
	Bagalkot	Traditional medicine	<ul style="list-style-type: none"> Traditional medicines for Nandikeswra PHC for prioritized health conditions such as Cough, Stomach ache and Common cold
		Traditional architecture	<ul style="list-style-type: none"> Malegitti Sivalaya of Badami (evolution of Chalukyan style of Architecture); Pattadakal (cradle of Chalukyan temples);

Region	District	Category/Area	Forms of knowledge
South Karnataka (Coastal, Malnad)	Dakshina Kannada(Coastal Karnataka)	Traditional	<ul style="list-style-type: none">• Forest-resource based culture(devarkadus (sacred grooves), nagabanas (preservation of reptiles, amphibians and cobras)• Protection of forests• Areca cultivations
	Udupi (Coastal Karnataka)	Cultural/Pilgrimage centre;	<ul style="list-style-type: none">• Anantesvara Temple (Holy seat of Sri Madhavacharya, inaugurator of the Dwaita School of Philosophy and one of the oldest temples in coastal Karnataka)
	Kodagu (Malnad)	Traditional aspects	<ul style="list-style-type: none">• Protection of forests/• Customary laws of preservation;• Forest-dependent culture• Coorgi style of costume• Unique for coffee and cardamom• Unique cattle breed
		Traditional medicines	<ul style="list-style-type: none">• Traditional medicines at Sreemangala PHC for prioritized health conditions such as Cough, Stomach ache and Fever
	Chikmagalur (Malnad)	Traditional aspects	<ul style="list-style-type: none">• Protection of forests/• Customary laws of preservation;• Forest-dependent culture• Coorgi style of costume;• Unique for coffee and cardamom, spices
		Traditional medicines	<ul style="list-style-type: none">• Traditional medicines at Chikmagalur in Begar PHC for prioritized health conditions such as Muttina hotte novu, Fever and Cough
	Shimoga (Malnad)	Traditional aspects	<ul style="list-style-type: none">• Distinct culture for literature, lifestyle and known for sandalwood;• Forest-dependent culture• Unique cattle breed (Malnad giddas);• Areca cultivations
	Hassan (Malnad)	Traditional architecture/sculptor	<ul style="list-style-type: none">• Statue of Gomateshwara or Bahubali at Shravanabelagola which is the peak in architectural and sculptural activity under Ganges of Talakkad• Chennakesava Temple at Belur (impressive architectural marvel of Hoysala architecture and sculpture)• Kedareshvara and Hoysalesvara temple at Halebid – fine architecture of Hoysalas;
		Traditional crops	<ul style="list-style-type: none">• Unique for coffee and cardamom
		Traditional medicines	<ul style="list-style-type: none">• Traditional medicines at Kalusadara halli PHC for prioritized health conditions such as Cough, Fever and Stomach ache
Maidan Karnataka	Mysore	Traditional architecture	<ul style="list-style-type: none">• Srirangapattana’s Sri Ranganathaswamy Temple and one of the largest Dravidian temples in Karnataka
		Literature	<ul style="list-style-type: none">• Chamundeswari temple• Saint Philomena’s Church• Mysore Palace (finest and majestic

Region	District	Category/Area	Forms of knowledge
			heritage buildings in the country)
		Traditional painting	• Mysore painting and carving
		Traditional Garment	• Mysore peta (turban) and Mysore silk saree
	Mandya	Traditional livestock	• Hallikar breed of cows; • Unique breed of Bannur sheep (offers unique variety of meat)
		Traditional food	• Uniqueness of making ghee and butter; • Culture of food of using millets, ragi, ragi-based food products
	Kolar	Traditional aspects	• Mango crops • Silk production • Dairy industry
	Tumkur	Traditional aspects	• Jack fruit • Architecture • Literature • Sheep-rearing and wool and blankets
		Traditional medicines	• Traditional medicines at Pattnayakanahalli PHC for prioritized conditions such as fever, cough, white discharge; • Traditional medicines at Yachenahalli GAD for prioritized conditions such as fever, cough, cold;
	Chamrajanagar	Traditional aspects	• Tribal way of maternal deliveries; • Tribal health care
	Davangere	Traditional aspects	• Commercial activities like rice, groundnut industry, textile, cotton cultivation • Known for forts, warrior culture
		Traditional medicines	• Traditional medicines for prioritised health conditions such Bili muttu, Cough and Ushna at Mallapura PHC
	Chitradurga	Traditional aspects	• Culture of food of using millets, ragi, ragi-based food products; • Known for forts, warrior culture;
	Bangalore Rural	Traditional aspects	• Known for unique horticulture practices, onions;
	Ramanagaram	Traditional medicine	• Traditional medicine for prioritized health conditions such as Body pain, Cough and White discharge at Suganhalli PHC
	Bangalore Urban	Traditional architecture	• Bangalore Palace built on the model of Windsor Palace • Vidhana Soudha (epitome of Hindu architecture and synthesis of Dravidian, Hoysala, Chalukya and Vijayanagara);
		Literature	
		Traditional food	• Bangalore grapes

Annexure VIII

International Best Practices and Success Stories for deriving Recommendations

1. Minimum standards in Higher Education –A Global Dialogue

(Excerpt from The Australian, Feb 17, 2010)

The federal government's plan for mandatory minimum standards for higher education is under way following a meeting of peak academic and industry groups convened by the Australian Learning and Teaching Council, which will co-ordinate the process across six broad discipline groups covering higher education.

The meeting agreed to make accountancy the pilot project in business, and ALTC discipline scholar Mark Freeman said an expert panel would draw up draft standards for consideration by academic and industry stakeholders in the coming months.

Associate Professor Freeman said he hoped agreed outcomes would be in place by the end of the year. The panel is expected to have three or four members and include experts on current accountancy courses in public and private institutions at undergraduate and masters level and in domestic and international contexts. The project is being imposed on the university system as part of Canberra's plan for national quality assurance that specifies minimum learning outcomes for all degrees.

A new regulatory agency, the Tertiary Education Quality and Standards Authority, due to be established this year, will monitor compliance by private providers and universities."As well as helping more students get to university the government is acting to ensure that all students receive a high quality education when they get there," Catherine Vandermark, from the Department of Education, Employment and Workplace Relations, told the meeting.

"Everybody believes it is in their best interest to have hard evidence of the quality of Australian courses," he said.

He stressed that the mandatory standards would set minimum outcomes for knowledge and skills and universities would be free to exceed them in terms of the learning outcomes and abilities they will require from graduates.

(Excerpt from the Higher Education Academy, Nov 25, 2010)

HEA to review UK Professional Standards Framework

A paper which sets out the proposed revisions to the scope, content and application of the current framework, developed in 2006 by the HEA, is being sent out across the HE sector over the coming week.

As part of the scoping and planning process for the review, the Academy asked institutional leaders, interest groups and other individuals about aspects of the current framework: which would benefit from further scrutiny and development, and which bring the most benefit.

These early soundings indicate that radical changes to the UKPSF are not considered necessary but that the time is right to address various issues, including a focus on the leadership and management of teaching and learning (through the introduction of a new standard descriptor), as well as on reward and recognition policies and practices for teaching in HE, and how these can be reflected through the UKPSF.

The review is timely in the context of the recent review of student finance by Lord Browne, which emphasises the importance of initial teacher training for higher education. While noting that "teaching in HE is diverse and a one size fits all licence to teach is not appropriate", it confirms the role of the UKPSF in ensuring that institutional provision "meets a nationally recognised minimum standard."

He goes on to recommend that higher education institutions should "require all new academics with teaching responsibilities to undertake a teaching training qualification accredited by the HE Academy, and that the option to gain such a qualification is made available to all staff – including researchers and postgraduate students – with teaching responsibilities."

The UKPSF review identifies ten areas for future development and asks consultees for feedback. These areas are: academic practice focus, external examiner training and development, disciplinary expertise, new and emerging technologies, sustainability, qualified to teach, public information, alignment of professional standards, progression and career enhancement, and recognition, reward and promotion.

Excerpt from: Securing a Sustainable Future for Higher Education in UK. October 12, 2010
 (www.independent.gov.uk/browne-report) – **Lord Browne of Madingley**

'The higher education system is currently overseen by four bodies. These will be replaced by a single Higher Education Council, charged with looking after students' interests and the public investment in higher education. It will take a more targeted approach to regulation, with greater autonomy for HEIs.

The Council will be independent from Government and from HEIs. It will have five areas of responsibility:

Investment – identifying and investing in high-priority courses; evaluating value for money; dealing with the unexpected, with the primary aim of protecting students' interests

Quality – setting and enforcing minimum quality levels across the whole sector

Equity of access – making sure that individual HEIs and the sector as a whole make measurable progress on admitting qualified students from disadvantaged backgrounds

Competition – ensuring that students get the benefits of more competition, by publishing an annual survey of charges, looking after the interests of students when an HEI is at risk and regulating the entry of new providers

Dispute resolution – students can ask the Council to adjudicate on a dispute that cannot be resolved within their HEI, and the Higher Education Council can provide a decision which binds both sides'

USA – Higher Education System, [Source: <http://www.worldaccruited.com/evaluations-and-standards.html>]

Six (6) regional accreditation associations set minimum standards for institutions chartered in the states of their respective jurisdictions. In addition, there are recognized accrediting agencies for specialized institutions and programmes. While all recognized and accredited institutions are licensed or chartered by state governments, states vary greatly in the degree of supervision and quality control that they exercise, and there is relatively limited reciprocity of recognition across state borders. Accreditation by recognized agencies, therefore, remains the primary means of ensuring academic and institutional quality and the mutual acceptance of credits and qualifications across and outside the United States.

The Bologna Process in Europe – Quality Assurance Standards for Higher Education

[Source: European Commission Report – The first decade of working in European Higher Education Area, Vol 1 – Detailed Assessment Report, <http://ec.europa.eu/>]

The growth of external quality assurance in higher education has been one of the most notable features of the Bologna decade. **European cooperation in quality assurance is exemplified by agreement on European Standards and Guidelines and the creation of a European Quality Assurance Register.**

Indian and UK Systems on Higher Education, UKIERI (May 2008), Excerpt

The Indian Quality Assurance system, unlike that of the United States, is essentially unitary and centralized in character. NAAC is the only agency that conducts accreditation of all institutions. Hence, even after 10 years of its establishment, it only covers 15-20% of the colleges. Accreditation is neither compulsory nor is it tied to the system of funding by UGC. As a result, the demand for accreditation is very low.

2. Industry specific Skill Development Councils – The Success Story of Australia

Involvement of research students to develop tools for industry can be a step forward in order to bring the creators, disseminators and users closer. Contacts can be set with Companies and multinationals to facilitate student identification and channelization in this regard. The Industry Skills Council in Australia, serves as a useful example in this case.

Industry Skill Councils in Australia

[Source: <http://www.isc.org.au/>, www.wikipedia.com]

Industry Skill Councils (ISC) in Australia are independent, professional and not-for-profit bodies set up to work with related industries across all areas to define the emerging skill specifications for the workforce. They are funded by the Australian government. As on 2005, there were 10 different skill councils in Australia. The councils are constituted for industries ranging from agri-food industry to manufacturing to construction and property to services. Examples of functions performed by the Manufacturing Industry Skills Council, that covers about 75,000 enterprises, are:

- Develops and maintains industry training packages
- Assists industries, enterprises and their workforces to integrate skill development with business goals.
- Supports high quality nationally recognized training products and services.
- Provides high level advice to government and employers on training needs of the manufacturing sector.
- Considers the interests of the whole manufacturing sector by coordinating research into skill development needs.
- Works closely with enterprises to integrate nationally recognized training with business strategies.

3. Knowledge Centres in Rural Areas (RKC's) -An Indian Example

There are various models of Rural Centres set up for Knowledge Dissemination in practise today that can be replicated. The most relevant model is the Madurai model envisaged by the Swaminathan Research Foundation which can be replicated in the State following a 'Bottom Up' approach with an active participation of the Panchayat Authorities.

Knowledge Centers in Villages Using ICTs by MSSRF (M.S. Swaminathan Research Foundation)

[Source: Connecting People Changing Lives in Asia, Pan Asia Networking (2005)]

In Pondicherry, using a makeshift modem-and-radio set-up with a solar power back-up, five village knowledge centers (VKCs) were established in the rural areas. These knowledge centers were community tele-centers, but combined with the proper physical and human infrastructure, they become the main channel for obtaining relevant and timely information. They provide people in rural areas with appropriate knowledge about livelihood, health and social well-being, and economic opportunities. MSSRF succeeded in demonstrating these benefits, particularly due to the high level of community involvement (in the community where each VKC is located, it must provide volunteer staff and guarantee equal access to all, irrespective of their social and economic situation). In 5 short years, more than 50 000 information-shop users in a dozen communities in Pondicherry have gained access to a new wireless Internet connection.

People also used the centers for obtaining more information about government financial schemes for the poor, health care, nutrition, sanitation, employment, food prices, education, and the costs and availability of agricultural inputs such as seeds, fertilizer, and pesticides, etc. Fishermen, dairy farmers, and coconut sellers also keep a watch on product prices. Teachers prepare lessons and students do homework. Panchayats, or local councils, do their accounting and correspondence, and gain access to grants for infrastructure such as roads, bus stations, streetlights, and drains. State and federal government representatives put together their reports and use voice lines to consult with superiors about local queries. Job seekers find employment. Older people share traditional medical. Many morning users come to centres to read newspapers. Everybody relies on weather reports.

4. Communication in Rural Areas through Community Radios—A World Bank Case Study

Community Radio & World Bank

[Source: <http://siteresources.worldbank.org/>]

As a part of the Bank's Empowerment and Respect for Diversity (CEERD) program works, one important focus is to support interested communities to establish community radio stations and to develop their capacities in programming, credible local reporting, station management and resource mobilization. This is being done as a preliminary phase, before developing larger support programs for the community radio sector. In particular, this phase will clarify how best to support the participatory planning and establishment of community radio and how to enhance capacity and the likelihood of sustainability. There is also a pressing need to learn good practices in the development, operations and maintenance of these community radio stations, particularly on issues important to their effectiveness. Likewise, there is a need to learn the risks involved and how to mitigate them. The findings of this phase can help better plan for a larger, more comprehensive support program for the community radio sector.

5. EDUSAT for Higher Education – An Example from Mexico

TV Educativa De Mexico

[Source: www.dgtve.sep.gob.mx]

The General Directorate of Educational Television (DGTVE) is a centralized body of the Ministry of Education, under the Planning and Evaluation Unit of Educational Policy started this program in 1964.

The tasks performed by the staff that integrates DGTVE are to produce, develop and transmit educational content via electronic media, especially television, through EDUSAT network.

These tasks make up a cycle that has led, over more than 35 years in business, explore and discover the vast potential of audiovisual education as a powerful tool that has certainly allowed an education and knowledge to remote areas and disadvantaged in the country, a wide range of users, through various modalities, levels and educational content.

6. Rural Mobile Telemedicine Units – The case of a Leading Provider in India

Apollo Telemedicine Networking Foundation

[Source: <http://www.telemedicineindia.com/ATNF.html>]

Apollo Telemedicine Networking Foundation (ATNF), a not-for-profit organization, is a part of the Apollo Hospitals Group. It is credited with being the first to setup a Rural Telemedicine centre in 1999 in Aragonda (in Andhra Pradesh). Today, ATNF has emerged as India's single largest turnkey provider in the area of Telemedicine with over 150 telemedicine centers across the globe. ATNF works with multiple entities including the Central and State Governments, medical bodies, private and public sectors, both at a domestic and international level to popularize the concept of Telemedicine.

Services include capturing the patient medical information such as patient medical history, diagnosis, treatment plan, surgeries undergone, investigations, etc. in an EMR (Electronic Medical Record). Others include:

- Schedule a Telemedicine appointment with the specialist
- Transfer medical records
- Confirm Telemedicine appointments
- Download EMR sent from Consulting Center
- View diagnostic data like X-rays, CT/MRI Scans, Ultrasound images etc.
- Send live comments of a doctor's to the patient

7. Promoting Functional Literacy – Morocco's Initiative

7. Functional Literacy in Rural Areas

Morocco launches functional literacy campaign in agriculture

[Source: <http://www.thefreelibrary.com>]

Morocco's Partnership Agency for Progress (APP) has launched functional literacy projects in the sector of agriculture for a sum of 3.8 million dollars. These projects are part of the Millennium Challenge Account (MCA)-Morocco programme, signed on August 31, 2007 in the northern city of Tetouan.

Some 3,100 farmers, 5,300 country women and 10,600 teenagers over 16 years old will benefit from these projects according to an innovative approach which highlights literacy as a way to promote job opportunities, says a statement of APP.

The Functional literacy programme implements an adapted learning approach aimed to combat school dropout often witnessed in many literacy projects. The programme provides additional training in the sector of agriculture, the environment, hygiene, citizenship and job promotion. The aim is to help beneficiaries in their behaviors, decisions, activities, according to the agency.

Managed by the APP, the MCA-Morocco programme, worth 697.5 million dollars, seeks to spur the country's economic growth through increasing productivity and improving employment in the sectors of fruit tree productivity, coastal fishery, craft industry, as well as providing support for enterprises and financial services.

8. Knowledge Management Portal – Example from India

Development & Maintenance of Rice Knowledge Management Portal (RKMP)

[Source: <http://rkmp.iari.res.in>]

Indian rice research and rice development programmes have been recognized as successful model endeavours all over the world. Data, information and knowledge differ from one rice growing region to another. The interaction between the data, information and knowledge gets much complicated and requires a more sophisticated approach. The Knowledge Management (KM) practices using Information & communication Technology (ICTs) are emerging fast as viable solutions. The Rice Knowledge Management Portal has been envisaged to enable rice workers to create, manage and share scientific, technical and market-related information for the benefit of all stakeholders. This portal will be developed by the Directorate of Rice Research, Hyderabad in collaboration with eight of its consortium partners to help strengthen communication and provide a platform for collaborative action and information sharing among various key players and stakeholders in the rice sector of India. The objectives of the exercise are:

- To develop structure and content of RKMP comprising research information system, extension information system, farmers' information system, service information system, general information system and e-learning platform related to rice.
- To pilot these information systems for uploading, sharing and harnessing rice knowledge amongst rice stakeholders.
- To build the capacity of the stakeholders in using the Rice Knowledge Management Portal for effectively transforming rice knowledge and information as a viable factor of production.

9. Innovations in Agriculture – Innovation in management practices

Precision Agriculture

[Source: <http://www.innovationmanagement.co.uk>, http://en.wikipedia.org/wiki/Precision_agriculture]

Precision farming or precision agriculture is a farming management concept based on observing and responding to intra-field variations. It relies on new technologies like satellite imagery and information technology. It is also aided by farmers' ability to locate their position in a field using satellite positioning system like GPS. It is one of the emerging agricultural developments in North America and Europe since the mid 1990s has been the concept of Precision Agriculture, or Site Specific Agriculture. Bringing together the application of Geographic Positioning Systems, GPS, agronomic decision support systems, variable application equipment and satellite imagery has presented a major marketing and communication challenge. Developments in equipment for the improved application of agrochemicals required specialist technical and marketing support. AN organization called 'Innovation Support' has helped these initiatives in a big way. Innovation Management's role, in the last few years, has been under the Sky Farm banner:

- Helping to develop a commercial service for farmers.
- Executing R & D projects based on satellite and airborne imagery for agrochemical and other agribusinesses.
- Undertaking market study, market and distributor analysis, study on the global market, management of a technical and market review of different equipments used and processes adopted.

10. Entrepreneurship & Income generation in Village Industries

Scheme of Fund for Regeneration of Traditional Industries (SFURTI)

[Source: <http://www.kvic.org.in>]

Government has launched the Scheme of Fund for Regeneration of Traditional Industries (SFURTI) in 2005 under which 100 traditional industry clusters (of khadi, village industry and coir) would be taken up for comprehensive development over 5 year. The KVIC and the Coir Board are the nodal agencies for the Scheme, which will be the first comprehensive initiative for regeneration of the khadi and village industries sector, based on the cluster development methodology. It aims to make traditional industries more competitive with more market-driven, productive, profitable and sustained employment for traditional industry artisans and rural entrepreneurs. The local governance systems of industry clusters have been aimed to strengthen with the active participation of the local stakeholders, so that they are enabled to undertake development initiatives by themselves. It also requires to build up innovated and traditional skills, improved technologies, market intelligence and new models of public-private partnerships. The support measures include:

- Replacement of machineries and tools.
- Setting up of Common Facility Centres (CFCs) with new machinery, store facilities, etc.
- Development of new products and designs with improved packaging, etc.
- Market promotion activities.
- Capacity building activities like exposure visits to other clusters and institutions, need-based training, support for establishment of cluster level networks, etc.
- Formation of SHGs, Cooperatives and Consortiums of the artisans.

11. Technological infrastructure such as broadband facilities in major Cities of Karnataka – Example of UK

'Broadband for all' scheme in UK

The UK government decided to provide each home in UK with a broadband connection with a single government portal with the websites of all the departments. The pilot for the scheme was launched in February, 2008 where 20000 families were benefited from the scheme. A total of £300 million is being spent on the scheme. It has the aim to get every family in the country online by the year 2011. Grants are also provided to poor households to buy computers and hardware required. Oldham and Suffolk were the first places where the plan was implemented, with low-income families eligible for grants of between £100 and £700 to buy a computer, software or internet access for one year. A single website bringing together all government and public sector services will allow people to manage pensions and benefits, pay council tax, apply for school places and jobs, and book doctors' appointments online from their home only.

It has been said that this would revolutionize the web history of the world with UK being one of the most well connected countries with transparency and efficiency in the system of management of public services and people's access to information.

Source:<http://www.broadband-finder.co.uk/news/free-broadband/government-broadband-for-all-scheme-to-pilot-in-february>, <http://news.bbc.co.uk/2/hi/8579333.stm>

12. Facilitating assimilation, sharing and profiling of Traditional Knowledge in Karnataka – A Starting Point

An example of mainstreaming activities for Traditional Knowledge is explained below. This attempt undertaken by the Karuna Trust, Foundation of Revitalisation of Local Health Traditions (FRLHT) and UNDP can be applied on a larger scale over a longer time frame by involving community level organisations.

Mainstreaming Traditional Medicine through PHCs – A Project by Karuna Trust, Foundation of Revitalisation of Local Health Traditions and UNDP

[Source: Our Traditions, Our Health, Our Lives (published by Karuna Trust)]

One of the main aims of this project was to explore the knowledge of traditional healers scattered across the state, compile and disseminate it to rural communities through PHCs to empower them to practice TM at the household level, 20 PHCs out of 29 PHCs where Karuna Trust was working were chosen as project sites for implementation of TM. Once PHCs and GADs were identified for implementation of TM, a baseline survey was done for rapid assessments of prevalent diseases, prioritisation of diseases were done. A database of common diseases prevailing in the region, health practices used by traditional healers to address these diseases and medicinal plants locally available in the area was made. Out of a list of 76 health conditions collated, four diseases commonly found in each PHC and GAD area were prioritised. Further, medicinal-plants based drugs were short-listed for the treatment of these health conditions. This was then validated to ensure credibility to the medicines and enhanced user acceptance. The validation was done by ayurvedic and allopathic doctors and experienced traditional healers to validate the chosen practices and drugs. Finally, the arogyamitras and other medical staff were identified and trained. Their responsibilities were clearly laid out.

The outcomes of the project was increase in number of people opting for traditional medicines at the PHC, increased knowledge on traditional medicinal plants and their use in the community, community's willingness to nurture traditional medicinal plants in their kitchen gardens, acceptance of traditional medicines by the health service providers and improved health-seeking behaviour of the community amongst others. This project helped revive the lost glory of TM and encouraged and enabled participation of communities in the documentation of their TM and to halt the exploitation with regard to IPR. It also addresses the concern of low access to formal health care system.

Annexure IX

Tools used for Primary data collection

I: Questionnaire for beneficiaries*

PART I: GENERAL						
Stratification Details						
a.	District Name	1. Uttara Kannada	5.Mangalore/DK			
		2.Bijapur	6.Hassan			
		3. Bellary	7.Bangalore Urban			
		4. Raichur	8.Chamarajanagar			
b.	Taluka Name					
c.	Village\Town\City Name					
d.	Location	1. Urban	2. Rural			
e.	Gender	1. Male	2. Female			
f.	Age group	1. 16-24 years	2.25-59 years	3. 60+ years		
g.	Occupation of respondent (Please write one option)	Self-employed in agriculture			1	
		Self-employed in non-agriculture			2	
		Agricultural labourer			3	
		Other casual labour			4	
		Regular/salaried employer			5	
		Unemployed			6	
		Others (specify) _____			7	
h.	Relevant sector for this survey (Please write all options applicable)	Health			1	
		Education			2	
		Agriculture			3	
		Rural Development			4	
		Urban Development			5	
B: Socio-economic Details						
i.	Name of the respondent					
ii.	No. of residents in household	1. 2-4 members		2. Greater than 4 members		
iii.	Educational qualification of respondent (Please write one option)	Not literate			1	
		LPS (I-V)			2	

		HPS (VI – VIII)	3	
		HS (IX-X)	4	
		PUC	5	
		Diploma/ Certification Course	6	
		Graduate/ PG & above	7	
iv.	Type of house where presently staying (One option)	Pucca	1	
		Semi-pucca	2	
		Serviceable-kutcha	3	
		Unserviceable kutcha	4	
		No structure	5	
v.	Primary fuel used for cooking at place of residence (All relevant options)	Firewood/ chips	1	
		Dung cake	2	
		Kerosene	3	
		LPG	4	
		Electricity	5	
		Others (gobar gas, bio gas, charcoal, coke, coal etc)	6	
		Do not cook at home	7	
vi.	Primary source of drinking water at place of residence (All relevant options)	Open Well	1	
		Hand pump	2	
		Tube / Bore well	3	
		Tap	4	
		Tanks/ pond/ lake / spring / canal	5	
		Others	6	
vii.	Primary fuel used for lighting at place of residence (One option)	Electricity	1	
		Kerosene	2	
		Solar	3	
		Others	4	
iii.	Type of ration card (One option)	BPL – Antyodaya (White/ Paper Sheet)	1	
		BPL (Green or Yellow)	2	
		APL (Blue or Saffron)	3	

		None	4	
Dissemination of Knowledge				
1.	What in your opinion does the current education system ensure? (Rank the top 3)	Jobs/ Employability	1	
		Higher income	2	
		Knowledge	3	
		Financial independence	4	
		Responsible citizen	5	
		Respect in the community	6	
		Opportunity to migrate to cities/ abroad	7	
		Others (Specify)_____	8	
2.	What are your expectations from the education system? (Rank the top 3)	Ensure employment	1	
		Provide respect in the society	2	
		Financial Independence	3	
		Responsible citizen	4	
		Ensure higher incomes	5	
		Improve chances of migrating to cities/ abroad	6	
		Others (specify) _____	7	
3.	What level of education do you feel is essential for a good quality of life? (Please write one option)	Literacy	1	
		Basic school education	2	
		Basic school education and vocational training	3	
		Diploma	4	
		Graduate	5	
		Post Graduate	6	
		Professional Course	7	
4.	Do you feel that your current educational qualification is sufficient to ensure a good quality of life for you?	Yes	1	
		No	2	

5.	Do you feel it is essential to undergo specialized training in addition to completion of formal education?	Yes	1	
		No	2	
6.	Are you aware of your Fundamental Rights under the Indian Constitution?	Yes	1	
		No	2	
7.	Which of the following legislative provisions are you aware of? <i>(Please write as many options as possible)</i>	Right to Information (RTI) Act	1	
		Right to Education (RTE) Act	2	
		Prevention of Domestic Violence Act	3	
		Prohibition of Child Marriage Act	4	
		Prevention of Child Labour Act	5	
		Dowry Prohibition Act	6	
		Consumer Protection Act	7	
		Prenatal Diagnostic Technique Act	8	
8.	Which of the following modes of information do you have access to? <i>(Please write as many options as possible)</i>	Newspapers/ Magazines	1	
		Television	2	
		Radio	3	
		Phone (Mobile, landline)	4	
		Internet / ICT (Computers)	5	
		Others (specify) _____	6	
9.	Do you have access to Computers/ICT/ Internet facilities in your village/town?	Yes	1	
		No	2	
10.	Which of the following do you have access to in your village/town? <i>(Please write as many options as possible)</i>	Healthcare centre	1	
		Anganwadi Centre	2	
		Primary School	3	
		Secondary School	4	
		ITI Institute	5	

		College/ University/ Professional Colleges	6	
		Public/Private Library	7	
		Police Station	8	
		Court or Panchayat Office	9	
		None of the above	10	
11.	Who/what is your source of information on various Govt. schemes? (Please write as many options as possible)	Media (TV/ Radio/ Documentaries/ Newspaper/ Magazine)	1	
		Government functionary	2	
		Private service provider	3	
		NGO/ civil society organisations	4	
		Community members/elders/family	5	
		Gram/ Zilla Panchayat members	6	
		Others (specify) _____	7	
12.	You/ your family have used the services provided at which of the following information centres? (Please write option if answer is yes)	Healthcare centre	1	
		Anganwadi Centre	2	
		Primary School	3	
		Secondary School	4	
		ITI Institute	5	
		College/ University/ Professional Colleges	6	
		Public/Private Library	7	
		NGO centers	8	
		None of the above	9	

Please tell if you strongly agree, agree, are indifferent, disagree, or strongly disagree with these statements

Code: [1] = Strongly agree [2] = Agree [3] = Indifferent/neutral [4] = Disagree [5] = Strongly disagree [6]= Not aware/Not applicable

(Use the following codes for answers and write only one option)

13.	Availability of ICT (Computers) has/will made/make knowledge easily accessible to me/ family.		1/2/3/4/5/6		
14.	Have you/ your family attended an IEC programme (workshops/awareness camps) conducted by Government/ NGO/ private agency in the last one year?		Yes	1	
			No	2	
			Not aware	3	
14 a.	If no, why?	We do not have time	1		
		It is not useful	2		
		We were not told the schedule	3		
		Never conducted in my village/town	4		
		We were not allowed to attend	5		
		Others (specify)	6		
15.	IEC programmes (workshops/awareness camps) have helped increase my awareness levels.		1/2/3/4/5/6		
16.	I feel there is sufficient interaction between academia/research/policy level institutions and citizens (For e.g. interaction with department officials or Govt.)		1/2/3/4/5		
17.	Do you feel that the current government schemes/ programmes adequately solve your problems/ challenges?		Yes	1	
			No	2	
			Somewhat useful	3	
			Not aware	4	
18.	Government service providers are sufficiently knowledgeable about their area of work (For. E.g the Corporator or Gram Panchayat members or Dept. officials know their area of work)		1/2/3/4/5/6		
19.	NGO/ private service providers are more knowledgeable about their area of work than Government service providers		1/2/3/4/5/6		
20.	Local government workers in my village/ town are sufficiently trained and equipped to effectively carry out their duties		1/2/3/4/5/6		
21.	Are you aware of the following schemes? (Please write as many options as possible)	MNREGS (Mahatma Gandhi National Rural Employment Guarantee Scheme)	1		
		Mid day meals	2		
		Scholarship programmes for students	4		

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	ng subject s? <i>(Please write as many options as possibl e)</i>	Education					
		Rights/Law (Right to Education, etc)					

Application of Knowledge

25.	Which sector do you prefer in the delivery of following services? (1 = Govt; 2= Private; 3= NGO) <i>(Please write options if applicable)</i>	Health	1	
		School Education	2	
		Higher Education	3	
		Water Supply	4	
		Public Transport	5	
26.	Do you feel the service providers are sufficiently knowledgeable/ sensitive to local problems/ needs?	Yes	1	
		No	2	
		somewhat useful	3	
27.	If a Government/ NGO/ Private entity approaches you to participate in an experimental pilot project, would you participate? (E.g. for Agriculture – experiments with new seeds, fertilizers, water management; For Rural/ Urban Development – innovative housing, sanitation, drainage)	Yes	1	
		No	2	
28.	Recent innovation and inventions have greatly enhanced my living conditions/ increased productivity levels/ reduced costs	Yes	1	
		No	2	
29.	Are you comfortable with usage of new technologies? (Computers, Internet, Mobile phones)	Yes	1	
		No	2	
30.	Which of these have you used in the last one year?	Computers	1	
		Internet	2	

		Mobile Phones	3	
		Others (specify)	4	
31.	Most of the techniques/ skills used by me/ my family are derived from traditional knowledge/ handed down from family elders.	Yes	1	
		No	2	
PART II: SECTOR SPECIFIC (AGRICULTURE)				
Respondent Identification				
a.	Serial No.			
b.	Name of the respondent			
c.	District Name	1. Uttara Kannada	5.Mangalore/DK	
		2.Bijapur	6.Hassan	
		3. Bellary	7.Bangalore Urban	
		4. Raichur	8.Chamarajanagar	
d.	Taluka Name			
Dissemination				
Please tell if you strongly agree, agree, are indifferent, disagree, or strongly disagree with these statements				
Code: [1] = Strongly agree [2] = Agree [3] = Indifferent/neutral [4] = Disagree [5] = Strongly disagree [6]=Not applicable				
(Use the following codes for answers and write only one option)				
32.	School education is helpful in increasing agricultural productivity	1/2/3/4/5		
33.	I feel basic education is essential to maintain and increase level of productivity for the next generation	1/2/3/4/5		
34.	It is important for rural schools to provide agriculture related knowledge to students (traditional practices and introduction to new methods, examples from around the country and abroad)	1/2/3/4/5		
35.	Where do you go for first level of agriculture related information? (Do NOT prompt answers and	Krishi Vigyaan Kendra	1	
		Raitha Samparka Kendras (Hobli level)	2	
		Kissan Call Centre (Central Scheme - Toll free number)	3	

	write all the options applicable)	Sahayavani (Dept Scheme- Toll free number)	4	
		Agriculture Universities/Research Centres	5	
		Family/ friends/ community members/ other farmers	7	
		GP/ ZP members	8	
		Agriculture department/ functionaries	9	
		Public Library	10	
		Phone-in programme	11	
		Others (specify)	12	
36.	How far is the closest information centre?	Within 10 kms from home	1	
		10-20 kms	2	
		20-30 kms	3	
		More than 30 kms	4	
		Have never accessed	5	
37.	Which of the following information are easily accessible (<u>information currently available</u>) at the local level? (Prompt all options one-by-one and write all the options applicable)	Prices of inputs (seeds, organic fertilizers, pesticides, manure, farm implements and equipments)	1	
		Expected market prices of output/ crops	2	
		Details of Govt. schemes	3	
		Supply of seeds/ fertilizers	4	
		Soil sample analysis	5	
		Water analysis	6	
		Weather forecast	7	
		Power Supply information	8	
		Water Supply information	9	
		Schedule of extension works – demonstrations, training by dept officers	10	
		Details on rural credit facilities	11	
		Post harvest facilities/ infrastructure – transport, warehousing, marketing etc.	12	

		Others (specify)	13	
38.	Which of the following do you feel best conveys Agriculture related information? (Prompt options one-by-one and write all the options applicable)	TV	1	
		Radio	2	
		Newsprint	3	
		Extension workers – demonstrations	4	
		Raitha Shakti Groups	5	
		Training programmes at DATC/ UTC	6	
		Displays at village information centre/ Krishi Vigyaan Kendra/ RSK	7	
		Exhibitions/ Fairs (state, district, taluk)	8	
		Crop competition (state and district)	9	
		Agriculture Portal/ Agriculture Dept website	10	
		Others (specify)	11	
39.	The availability of an agriculture portal (agriculture dept website) with information on various agricultural practices, prices, weather conditions will be useful.	Yes	1	
		No	2	
39 a.	If YES, what information on the online-agricultural portal would be useful for you? If NO, enter NA. (Prompt all options and RANK the TOP THREE answers)	Prices of inputs	1	
		Expected prices of output/ Govt support prices for crops	2	
		Weather conditions/ forecast	3	
		Details on government schemes	4	
		Details on rural credit facilities	5	
		Post harvest facilities/ infrastructure	6	
		Details of agriculture extension programmes	7	
		Details on innovative agricultural practices/ methods	8	
		Inventory at RSK	9	
		Water analysis	10	

		Soil analysis and fertilizer recommendations	11	
		Legal advice (on sale or purchase of land)	12	
		NA	13	
		Others (specify) _____		
40.	There exists a formal channel for interaction between farmers and suppliers of inputs (seeds, fertilizers, pesticides, farm equipment, machines etc.)	1/2/3/4/5/6		
41.	There is a formal channel of interaction between farmers and Agri-based industries (food processing industries buying agriculture produce)	1/2/3/4/5		
42.	There exists a formal channel for interactions between farmers and researchers/ research institutes (agriculture university)	1/2/3/4/5		
43.	The agricultural extension workers are competent (dept officers that come for demonstrations)	1/2/3/4/5/6		
44.	What are some areas where farmer training programmes may be introduced? (Do NOT prompt answers and write all the options applicable)	Innovative agricultural practices	1	
		Water shed management	2	
		Use of new seeds/ fertilizers/ pesticides	3	
		Information on credit facilities	4	
		Any others (specify)	5	
45.	Are you aware of these agriculture sector schemes? (Prompt one-by-one and write all the options applicable)	Free/ subsidised seeds	1	
		Free/ subsidised fertilisers and pesticides	2	
		Free/ subsidised farm equipment	3	
		Subsidised crop loans	4	
		Other Agricultural loans	5	
		Training and demonstrations	6	
		Crop Insurance Schemes	7	
46.	What information display would be useful at the local/ nearest agriculture information centre?	Prices of inputs (seeds, pesticides, farm equipment)	1	

	(E.g. RSK, Krishi Vigyaan Kendra etc) (Prompt all options one-by-one and write all the options applicable)	Expected market prices of output	2	
		weather forecast	3	
		Details of government schemes	4	
		Schedule of extension works – demonstrations and training by agriculture department officers)	5	
		Details on rural credit facilities	6	
		Procedure for usage of new technologies/ inputs to increase productivity	7	
		Post harvest facilities/ infrastructure (transport, warehousing, marketing, sourcing assistance)	8	
		No additional information is required/ do not use	9	
		Others (specify) _____	10	
47.	The current government schemes in agriculture have helped solve problems/ challenges in the sector		1/2/3/4/5/6	
48.	What are some of the areas where interventions are urgently required? (May prompt responses. Write all the options applicable)	Rural credit facilities	1	
		Post harvest facilities/ infrastructure (transport, warehousing, marketing, sourcing assistance)	2	
		Timely supply of inputs (inventory management at RSK)	3	
		Watershed/ water management	4	
		Measures to address soil degradation	5	
		Check on input prices and quality	6	
		Grading of agricultural produce	7	
		Better response to natural calamities like floods/ droughts	8	
		Others (specify) _____	9	
Application of knowledge				

49.	The government extension programmes(demonstrations, trainings) have been useful to me/ my friends	1/2/3/4/5		
50.	The local financial institutions(banks) provide adequate support to farmers in the area	1/2/3/4/5		
51.	The knowledge about most of the agricultural practices followed by me have been handed down from my family/ tradition	1/2/3/4/5		
52.	Have you/ your village been part of any innovative pilot projects related to new seeds/ water shed management/ crop rotation/ fertilizers/ pesticides	Yes	1	
		No	2	
52 a.	If yes, have you/ your friends adopted these practices?	Yes	1	
		No	2	
52 b.	If yes, how have they been useful? (Do NOT prompt answers and write all options applicable)	Increase productivity of land	1	
		Increased labour productivity	2	
		Increased Incomes	3	
		Reduced Costs	4	
		Helped reduce environmental degradation	5	
		Any others _____	6	
52 c.	If no, why? (Do NOT prompt answers and write all options applicable)	Prefer traditional/ existing methods	1	
		Not suited to local conditions	2	
		Required inputs (equipment/ tools/ seeds/ fertilizers/ others) not available	3	
		Not affordable	4	
		Training was inadequate	5	
		Any others _____	6	

Survey Details				
		A. Form filled by:	B. Quality Check by:	C. Data Entry by:
1.	Name			
2.	Place			

*This questionnaire specifically targeted beneficiaries from agriculture sector. Similarly questionnaires for beneficiaries from other sectors were also made.

II. Questionnaire for Service Providers

Personal Details				
a.	Name of Respondent			
b.	Gender	1.Male	2.Female	
c.	Name of Service unit			
d.	Nature of Service provider	1.Public	2.Private	
e.	Designation of respondent			
f.	Name of Village/ Town/ City			
g.	District			
Knowledge Creation				
Please tell if you strongly agree, agree, are indifferent, disagree, or strongly disagree with these statements				
Code: [1] = Strongly agree [2] = Agree [3] = Indifferent/neutral [4] = Disagree [5] = Strongly disagree [6]=Not applicable/ not aware				
(Use the following codes for answers and write only one option)				
1.	The state has high quality researchers in your field	1/2/3/4/5/6		
2.	The state government is doing enough to promote research activities	1/2/3/4/5/6		
3.	There is sufficient government FUNDING for research activities in the state.	1/2/3/4/5/6		
4.	There are sufficient rewards and incentives for <u>teaching and research</u> in the state.	1/2/3/4/5		
5.	Are you aware of the Traditional Knowledge Digital Library initiative of the government?	Yes	1	
		No	2	
C: Knowledge Dissemination				
6.	What in your opinion does the current education system ensure? (Prompt all options and Rank the top 3)	Job/ Employability	1	
		Higher income	2	
		Knowledge	3	
		Respect	4	
		Financial Independence /	5	

		Freedom		
		Make responsible citizen	6	
		Opportunity to migrate to cities/ abroad	7	
		Others (Specify)	8	
7.	Educated beneficiaries are better equipped to absorb knowledge (E.g. educated parents/ patients better understand information given to them or entitlements under govt schemes)	1/2/3/4/5		
8.	Beneficiaries are sufficiently aware about their rights and entitlements (E.g parents of students/ patients know what they are entitled to under govt programmes)	1/2/3/4/5		
9.	Service providers are sufficiently knowledgeable about the rights of the citizens (E.g dept officers are aware of what beneficiaries are entiled to under schemes)	1/2/3/4/5		
10.	ICT/ computers/ internet has been an effective way to disseminate information among service providers	1/2/3/4/5		
11.	There is a formal channel for interactions between service providers and researchers/policy planners (interaction between you and policy makers, dept officers)	1/2/3/4/5		
12.	How often do you receive training related to your scope of service provision? (Write only ONE option)	Never	1	
		Once in 5 years	2	
		Once in 2 years	3	
		Annually	4	
		Twice a year	5	
13.	Do you feel the frequency of training is sufficient?	Yes	1	
		No	2	
14.	Do you feel the training is useful in improving your understanding of the service area and delivery of services?	Yes	1	
		No	2	
15.	All service providers are sufficiently knowledgeable about the major government schemes ?	1/2/3/4/5		
16.	I feel beneficiaries have a good level of understanding about the government schemes and entitlements	1/2/3/4/5		
Knowledge Application				

17.	What initiatives will help improve the levels of service delivery in your field? (Do NOT prompt responses and write ALL the options applicable)	More interactions between policymakers and researchers	1	
		Improve overall education level	2	
		Provide better infrastructure	3	
		Improve access to internet/ computers	4	
		Any others (specify)	5	
18.	ICTs (computers/ internet) have helped improve the quality of service delivery.	1/2/3/4/5		
19.	Periodic training programmes are essential to maintain/ improve service delivery standards	1/2/3/4/5		
20.	The state provides enough scope and freedom for innovation and entrepreneurship in your field	1/2/3/4/5		
21.	The State Government is taking sufficient steps to promote entrepreneurship	1/2/3/4/5		
22.	What do you feel are the main constraints to innovations/ entrepreneurial activities in the state? (Do NOT prompt and write all the options applicable)	Funding	1	
		Governance issues (Corruption, tax incentives, IPRs etc)	2	
		Infrastructure	3	
		Local environment (law and order/ mentoring facilities etc)	4	
		Man-power issues (skill sets/ costs/ trade unions)	5	
		Motivation level among employees	6	
		Lack of rewards and recognitions	7	
		Regulatory and compliance issues (labour regulations, procedures for setting up enterprises)	8	
		Overburdened with current responsibilities	9	
there are no constraints	10			

23.	Are you aware of any wide spread application of traditional knowledge in your field? Please state in which service area and in which location. (E.g use of traditional methods of cultivations / homeopath medicine / traditional methods of construction of houses etc) (Please write response)			
24.	Do you feel there will be high level of acceptance to new technologies within your organisation and among beneficiaries? (E.g introduction of computers for employees or online database for beneficiaries?)	Yes	1	
		No	2	
25.	What are the primary road blocks to the introduction of new concepts/ technologies on the wide scale in the state?	Lack of training	1	
		Lack of interest to learn among employees/ beneficiaries	2	
		Low level of education	3	
		Lack of infrastructure (electricity, connectivity, computers etc.)	4	
		There are no road blocks	5	
		Any others (specify)	6	

Survey Details

		A. Form filled by:	B. Quality Check by:	C. Data Entry by:
	Name			
	Place			

III. Questionnaire for researchers and policy planners

Instructions to fill the schedule:

Please provide your additional comments/ remarks wherever necessary

Please write your response(corresponding serial number) in the last column

Please write your comments(if any) in the space provided

A: Personal Details				
1.	Name of Respondent			
2.	Gender	1.Male	2.Female	
3.	Name and address of organisation/ institute			
4.	Designation			
5.	District			
6.	Area of research (Sector)	1. Education	2. Health and Nutrition	3. Agriculture
		4. Rural Development		5. Urban Development
B: Dissemination of Knowledge				
Please tell if you strongly agree, agree, are indifferent, disagree, or strongly disagree with these statements				
Code: [1] = Strongly agree [2] = Agree [3] = Indifferent/neutral [4] = Disagree [5] = Strongly disagree [6]=Not aware/Not Applicable				
(Use the following codes for answers and write only one option)				
1.	What in your opinion does the current education system ensure? (Rank the top.3)	Job/ Employability	1	
		Higher income	2	
		Knowledge	3	
		Respect	4	
		Financial Independence	5	
		Responsible citizenry	6	
		Opportunity to migrate to cities/ abroad	7	
		Others (specify)_____	8	
2.	The current education system encourages students to take up research activities in various areas Enter comments if any...		1/2/3/4/5 Or Not aware/ NA [6]	

3.	Providing citizens access to modern technology (ICT) can greatly enhance the reach of knowledge in Karnataka <i>Enter comments if any...</i>	1/2/3/4/5 Or Not aware/ NA [6]	
4.	There is a formal channel for interaction between researchers/policy planners and public service providers <i>Enter comments if any...</i>	1/2/3/4/5 Or Not aware/ NA [6]	
5.	There is a formal channel for interaction between researchers/policy planners and intended beneficiaries of public services <i>Enter comments if any...</i>	1/2/3/4/5 Or Not aware/ NA [6]	
6.	Interactions between academia and industry have made current curricula more job oriented <i>Enter comments if any...</i>	1/2/3/4/5 Or Not aware/ NA [6]	
7.	What are the major HR related issues in the promotion of research in Karnataka? (Pl. mention top 3 issues)		
C: Creation of Knowledge			
8.	The state has high quality researchers <i>Enter comments if any...</i>	1/2/3/4/5 Or Not aware/ NA [6]	
9.	There has been sufficient number of patents filed from Karnataka in the last 5 years <i>Enter comments if any...</i>	1/2/3/4/5 Or Not aware/ NA [6]	
10.	The state researchers have contributed sufficient number of publications in national/ international journals in the last 5 years <i>Enter comments if any...</i>	1/2/3/4/5 Or Not aware/ NA [6]	

11.	There is a healthy enrolment of PhD students in the state. <i>Enter comments if any...</i>	1/2/3/4/5 Or Not aware/ NA [6]	
12.	There is sufficient inter-disciplinary research being done in Karnataka. <i>Enter comments if any...</i>	1/2/3/4/5 Or Not aware/ NA [6]	
13.	There is a sufficient collaboration between research institutions in the state and those in other states/ countries. <i>Enter comments if any...</i>	1/2/3/4/5 Or Not aware/ NA [6]	
14.	In your view, which are the existing forms of collaboration between institutions?	Student exchange/Twinning Programme	1
		Faculty exchange	2
		Joint projects	3
		Others (specify)	4
15.	What are the primary/ popular areas of research in the state in your field? <i>(Please mention top 3)</i>		
16.	Which are the areas of research in your field that have been neglected and require critical and immediate attention? <i>(Please mention top 3)</i>		
17.	What are some of the initiatives taken up by the Government departments to promote research activities in the state? <i>(Please write all relevant options)</i>	Scholarships	1
		Increase stipend	2
		Inter-university collaborations	3
		Collaborations with foreign universities	4

		Awards and recognition	5	
		Others (specify)	6	
18.	In your view, are there any other initiatives that the State Government should take to support research activities in the state? If yes, please elaborate up to 3 initiatives			
19.	In your view, should the private sector play a more active role in research?	1.Yes	2.No	
19 a.	If yes, how can the state Govt. attract private sector into research? (Top 3 suggestions)			
20.	State is providing sufficient funding for research activities <i>Enter comments if any...</i>	1/2/3/4/5 Or Not aware/ NA [6]		
21.	There are sufficient rewards and incentives for teaching and research in the state <i>Enter comments if any...</i>	1/2/3/4/5 Or Not aware/ NA [6]		
22.	The state has sufficient number of faculty in universities and colleges <i>Enter comments if any...</i>	1/2/3/4/5 Or Not aware/ NA [6]		
23.	The state has distinguished and well-renowned faculty to support research activities <i>Enter comments if any...</i>	1/2/3/4/5 Or Not aware/ NA [6]		
24.	Research institutions in the state have good access to digital media <i>Enter comments if any...</i>	1/2/3/4/5 Or Not aware/ NA [6]		

25.	<p>Research institutions in the state have good access to libraries</p> <p><i>Enter comments if any...</i></p>	<p>1/2/3/4/5</p> <p>Or</p> <p>Not aware/ NA [6]</p>	
26.	<p>Research institutions in the state have good access to laboratories</p> <p><i>Enter comments if any...</i></p>	<p>1/2/3/4/5</p> <p>Or</p> <p>Not aware/ NA [6]</p>	
27.	<p>The current regulatory framework for patents has promoted high-quality research in the state</p> <p><i>Enter comments if any...</i></p>	<p>1/2/3/4/5</p> <p>Or</p> <p>Not aware/ NA [6]</p>	
28.	<p>There exists a formal mechanism to identify and document traditional knowledge in the state</p> <p><i>Enter comments if any...</i></p>	<p>1/2/3/4/5</p> <p>Or</p> <p>Not aware/ NA [6]</p>	
28 a.	<p>What are the main bottlenecks encountered in identifying and documenting traditional knowledge?</p>		
29.	<p>There is sufficient scientific research on knowledge obtained through traditional sources in the state</p> <p><i>Enter comments if any...</i></p>	<p>1/2/3/4/5</p> <p>Or</p> <p>Not aware/ NA [6]</p>	
30.	<p>Are you aware of the Traditional Knowledge Digital Library (TKDL) initiative of the state Government?</p>	<p>1. Yes</p>	<p>2. No</p>
31.	<p>TKDL has been successful in preserving and documenting traditional knowledge concepts</p> <p><i>Enter comments if any...</i></p>	<p>1/2/3/4/5</p> <p>Or</p> <p>Not aware/ NA [6]</p>	

D: Application of Knowledge			
32.	The state provides a conducive environment for innovation and entrepreneurship (application of research work) <i>Enter comments if any...</i>	1/2/3/4/5 Or Not aware/ NA [6]	
33.	What initiatives has the state taken to support entrepreneurial activities? <i>(Pl. mention the top 3 initiatives)</i>		
34.	What do you feel are the main constraints to innovations/ entrepreneurial activities in the state? <i>(Pl. mention the top 3 constraints)</i>		
35.	Are you aware of any wide spread application of traditional knowledge in the state? Please give details – sector, location, etc		
36.	What are the primary roadblocks to the widespread introduction of new concepts/ technologies in the state? <i>(Pl. mention the top 3 roadblocks)</i>		
37.	What are your expectations from a “knowledge society”?		
38.	What in your opinion are the major bottlenecks to making Karnataka a ‘Knowledge Society’?		

39.	What in your opinion are some of the enabling strategies to converting Karnataka into a Knowledge Society?	

IV: Questionnaire for researchers in the field of Traditional Knowledge

Instructions to fill the schedule:

Please write your answers/comments in the space provided

Please provide details and add references/documents where possible

A: Personal Details		
1.	Name of Respondent:	
2.	Gender	
3.	Name and address of organisation/ institute	
4.	Designation	
5.	District	
B: Traditional Knowledge in Karnataka		
1.	Are you working on or supervising research on Traditional Knowledge (TK)?	
2.	What are your areas of specialization/interest in TK	
3.	In your view, which areas of TK research are most popular in Karnataka	
4.	Assimilation of TK: Have you/your organization compiled any databases for TK in Karnataka?	
5.	What is the process involved in collecting/assimilating TK? (Please list the main primary and secondary data sources that you may have used)	
6.	In your research, have you ever tied up or collaborated with any local organizations? (Please provide details)	
7.	Did you/ your organization conduct trainings for Community Facilitators/locals/surveyors for collecting TK for research?	
8.	Sharing & Application of TK: In your view, what are key ways of sharing TK. E.g. Research papers, Indian Journal of Traditional Knowledge, Traditional Knowledge Digital Library, People’s Biodiversity Register (section on TK) etc.?	

9.	Have you worked with any key Industry players/private firms/multinationals on TK related projects in Karnataka? (If Yes, Please provide details)	
10.	Defining the Role of State: In your view, how can the government/state agencies in Karnataka best support the process of assimilation of TK?	
11.	In your view, how can the government/state agencies in Karnataka best support the process of sharing and application of TK?	

Building relationships

Creating value

This report has been prepared for and only for Karnataka Jnana Aayoga in accordance with the terms of our engagement contract for study on "Building Knowledge Society in Karnataka" as per Office Order 10 dated March 26, 2010 and for no other purpose. We do not accept or assume any liability or duty of care for any other purpose or to any other person to whom this report is shown or into whose hands it may come save where expressly agreed by our prior consent in writing. The assertions and conclusions are based on the information available at the time of writing this report and PwC will not be responsible to rework any such assertion or conclusion if new or updated information is made available. PwC disclaims all liability to any third party who may place reliance on this report and therefore does not assume responsibility for any loss or damage suffered by any such third party in reliance thereon. This report is provided on the basis that it is for the use of the client only and that it will not be copied or disclosed to any third party or otherwise quoted or referred to, in whole or in part, without PwC's prior written consent. Furthermore, PwC will not be bound to discuss, explain or reply to queries raised by any agency other than the intended recipients of this report.

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Karnataka Jnana Aayoga

(Karnataka Knowledge Commission)

Government of Karnataka

Room No. 219, 2nd Floor, Vidhana Soudha Dr. B.R. Ambedkar Veedhi

Bangalore-560 233. Karnataka

Ph: 080-22033297. Fax: 080-22342695

Website: www.jnanaayoga.in